SUPER
G3 FAX BOARD-F1

SERVICE
MANUAL

REVSION 0
(230V)

Canon

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INTRODUCTION

This Service Manual provides the following:

- Descriptions of the product quality and functions of the FAX Board installed to the GP405/335 Series.
- Descriptions of the board needed when servicing in the field.

For basic information on product quality and functions needed to service a GP405/335 Series machine in the field, refer to the GP405/335 Series Service Manual.

This manual consists of the following chapters:

Chapter 1	Introduction, provides an outline of the product and its specifications together with points to note for servicing work.
Chapter 2	Operation, explains basic mechanisms and functions.
Chapter 3	Mechanical, explains circuits and modular units used for fax functions.
Chapter 4	Service Mode, explains service soft switches.
Chapter 5	Error Codes, explains error codes and various reports.
Appendix	provides general circuit diagrams.

The information in this manual is subject to change for product improvement, and major changes will be communicated in the form of a Service Information bulletin.

All service persons are encouraged to go through the contents of this Service Manual and each Service Information bulletin to develop a thorough understanding of the product and to be able to identify any fault that may occur over the life of the product.

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I. OUTLINE OF THE PRODUCT

The FAX Board possesses image processing functions which enable a digital black-and-white copier to serve as a fax (transmission/reception) machine and communications functions which enable its host copier to be connected to a telephone line.

The FAX Board is capable of transmitting image data at 33.6 kbps (max.), thanks to its V.34-compatible modem complying with ITU-T.

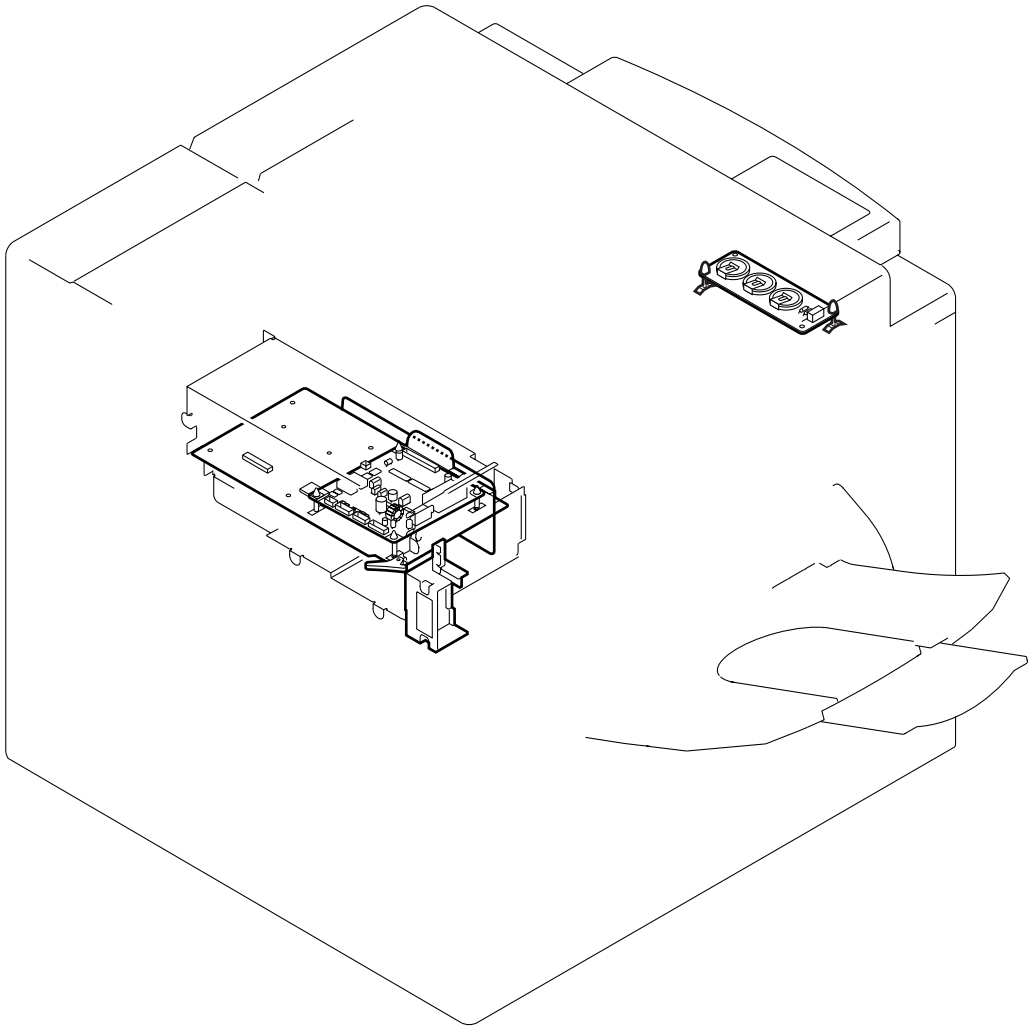

Figure 1-101

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II. SPECIFICATIONS

A. Standards and Performance

The FAX Board is designed to comply with the standards and performance levels indicated. (Scanner and printer functions are as indicated for the GP405/335.)

1. Communication System

Item	Description
Type certification	
Model	GP405/335
Applicable line	General subscriber telephone network, fax communication network (Class 2 terminal)
Number of lines	PSTN: 1 line
Communication method	Half-duplex, full duplex (V. 34)
Transmission speed (bps)	33.6 k, 31.2 k, 28.8 k, 26.4 k, 24.0 k, 21.6 k, 19.2 k, 16.8 k, 14.4 k, 12.0 k, 9.6 k, 7.2 k, 4.8 k, 2.4 k
Modulation method (image transmission)	ITU-T V.34 (33.6 kbps to 2.4 kbps), ITU-T V.33 (14.4 k/12.0 kbps) ITU-T V.17 (14.4 k/12.0 kbps/TC9.6 k/TC7.2 kbps) ITU-T V.29 (9.6 k/7.2 kbps), ITU-T V.27ter (4.8 k/2.4 kbps)
Modulation speed (baud rate)	2.400, 3.000, 2.743, 2.800, 3.429 (for V. 34 only)
G3 protocol signal	ITU-T V.21 (300 bps) ITU-T V.34 (1200 bps)
Coding method	JBIG, MMR, MR, MH
Communication protocol	ITU-T T. 30 binary protocol/ECM method ITU-T V. 8 protocol V. 34 protocol/ECM method
G3 independent auto abbreviation protocol	CEP I, II
Transmission output level	-8 to -15 dBm
Minimum reception sensitivity level	-43 dBm
Modem IC	Rockwell R288F
Reciprocal communication	G3 (no G2/G1/MF)
Error correction	ITU-T ECM method (may be disabled)

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Item	Description
Transmission time*	JBIG/33.6 kbps: 3 sec ECM-MMR/33.6 kbps: 2 sec G3 MH/14.4 kbps: 13 sec ECM-MMR/14.4 kbps: 6 sec G3 MR/9.6 kbps: 18 sec ECM-MMR/9.6 kbps: 9 sec G3 MH/9.6 kbps: 19 sec G3 MR/14.4 kbps: 2 sec

*Using Canon FAX Standard Chart No. 1.

2. Reading System

Item	Description
Transmission original size	A3, A4, A4R, A5, A5R, B4, B5, B5R, LTR, LTRR, LGL, 11x17, STMT, STMTR DADF: two-sided original possible
Scanning line concentration	Standard: 8 dots/mm x 3.85 lines/mm Fine: 8 dots/mm x 7.7 lines/mm Super Fine: 8 dots/mm x 15.4 lines/mm Ultra Fine: 16 dots/mm x 15.4 lines/mm (in direct transmission, 200 dpi, 400 dpi priority)
Reading density adjustment*	3 levels + AE (in user mode, 9 levels; for text mode, ABC)
Halftone	Photo mode (256 gradations), text/photo mode (Auto Adjust)

*In AE mode, ABC correction is executed.

3. Recording System

Item	Description
Maximum original size	A3 (297 x 420 mm)
Recording paper size	A3, A4, A4R, A5, A5R, B4, B5, B5R, LTR, LTRR, LGL, 11x17, STMT, STMTR (cassette pick-up only; 6 cassettes max.)
Maximum reception size	A3 (297 x 420 mm)
Scanning line concentration (recording)	Main scanning: 600 dpi (reception)
	Sub scanning: 600 dpi
Test shot	Provided

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4. Memory

Item	Description
Image memory	Standard: 32 MB (about 640 pages; using Canon FAX Standard Chart No. 1) Expansion (accessory) 32 MB (64 MB max.; about 1000 pages) 32 + 3 2 MB (96 MB max.; about 1000 pages)
Page memory	Standard: 14 MB (Standard/Fine resolution) Expansion: 23 MB (approx.; accessory)
Back-up memory (against power shortage)	Type: lithium ion secondary battery Discharge: 3 hr (approx.) Contents: image data
Memory indicator	Provided

5. Transmission System

Item	Description
Memory transmission	Provided (100 items max.; direct transmission when memory is full)
Direct (manual) transmission	Provided
Broadcasting	Provided (216 destinations max.; 60 for one-touch; 140 for speed; 16 for keypad)
Memory polling transmission	Provided (memory box)
Fixed time multi polling	Provided (1 setting only)
Confidential function (address-specific transmission)	Provided (by specifying address; ITU-T standards)
Time sharing dial	Provided
Transmission reservation	Provided
Address-specific collective transmission	Provided
Mail post transmission	Timer destination-specific collective transmission (200 max.; one-touch + speed; 5 time settings)
2-on-1 transmission	Provided (w/ DADF-A1 only)
Timer transmission	Provided (200 destinations max.; 32 time settings)
Rotation transmission	Provided
Stamp	Provided (w/ DADF-A1 only) READ stamp, SENT stamp (in direct transmission mode only)
Dual access	Provided
Interrupt transmission	Provided (direct transmission)
Error re-transmission	Provided (memory reference)

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6. Reception System

Item	Description
Manual reception	Provided
Confidential reception	Provided (using memory box)
Memory reception	Provided (640 pages* approx.; automatic output)
Forced memory reception	Provided (time may be specified)
Multi polling reception	216 destinations max.
Rotation reception	Provided
Number of printouts (received pages)	1 to 99
Received image reduction	Provided Reduction ratio: 97%, 95%, 90%, 75% Auto or fixed may be selected Vertical/horizontal or vertical only may be selected
Cassette switch (A, B, C, D)	A: reduced recording B: margin recording (same paper configuration) C: reduced recording (different paper configuration) D: margin recording (on larger paper to suit received page)
Reception sequential printing	Provided
Reception two-sided printing	Provided (A4, A4R, B4, A3; w/ duplexing unit only)
n-on-1 recording	A5 + A5 → A4; B5 + B5 → B4; A4 + A4 → A3 (n being 3 max.; for extra-length page only)
Forwarding	Provided (time may be specified; source may be specified)
Memory box	Provided (confidential, relay, fixed time, transmission bulletin, general purpose)
Linear reduce/enlarge reception output	Provided (long-size page reduced to default size by 75% to 100%)
Reception footer	Provided (records time of reception)

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7. Dialing

Item	Description
One-touch dial	60 destinations; 120 characters max. (telephone number), 24 characters
Speed dial	140 destinations, 120 characters max. (telephone number), 24 characters
Group dial	119 groups (may be of one-touch/speed numbers)
Keypad dial	On-hook/off-hook
Auto dial	2 min (may be between 2 and 99 min) 2 times (may be between 1 and 15) At time of error, only on page 1 and error page (may be all pages or otherwise)
Electronic directory	Provided

8. Communications Control System

Item	Description
Reports	Communications control report (40 communications) Transmission results report Reception results report Multiple communications results report Memory clear report One-touch dial telephone number list 1, 2 Speed dial telephone number list 1, 2 User data list System data list System dump list Communications reservations list group dial telephone numbers list error transmissions report memory box receptions report originals list
Caller name	Provided (99 names max.)
Memory reference	The following are possible: • generating list of originals in memory • printing originals in memory • clearing memory • re-transmitting • indicating list of communication reservations (reservation may be canceled) • indicating communications results
Group-by-group control	Group code, password (100 each; 4-character number)

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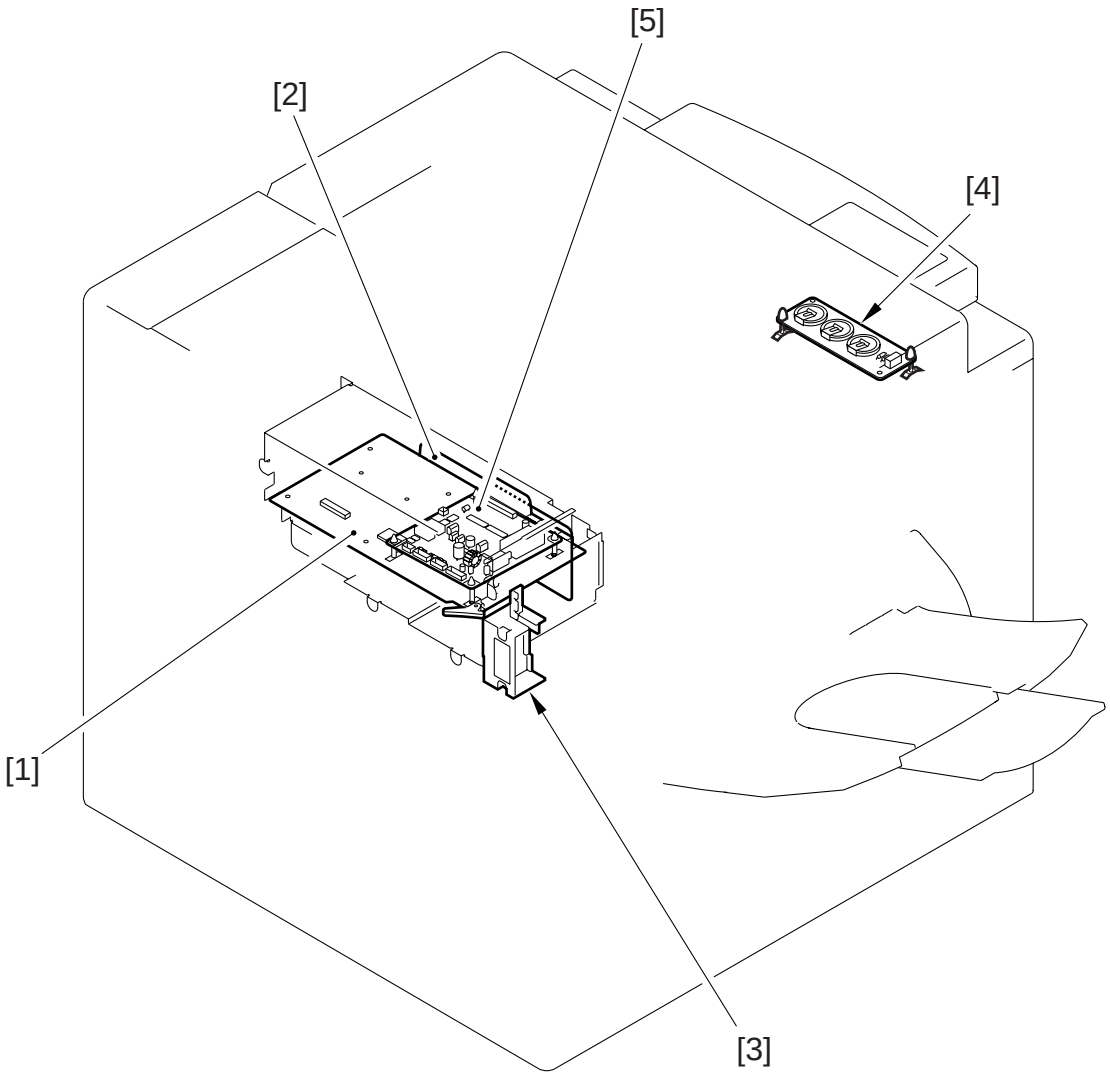
9. Transmission Original Editing System

Item		Description
Edit transmission	Two-sided reading	Provided (w/ DADF only)
	2-on-1	Provided (w/ DADF only)
	Reduction/ enlargement	Provided

Specifications subject to change for product improvement.

III. NAMES OF PARTS

A. Location of the FAX Board



[1] FAX PCB
[2] System Motherboard
[3] MJ(modular jack) PCB
[4] Battery board
[5] NCU PCB

Figure 1-301

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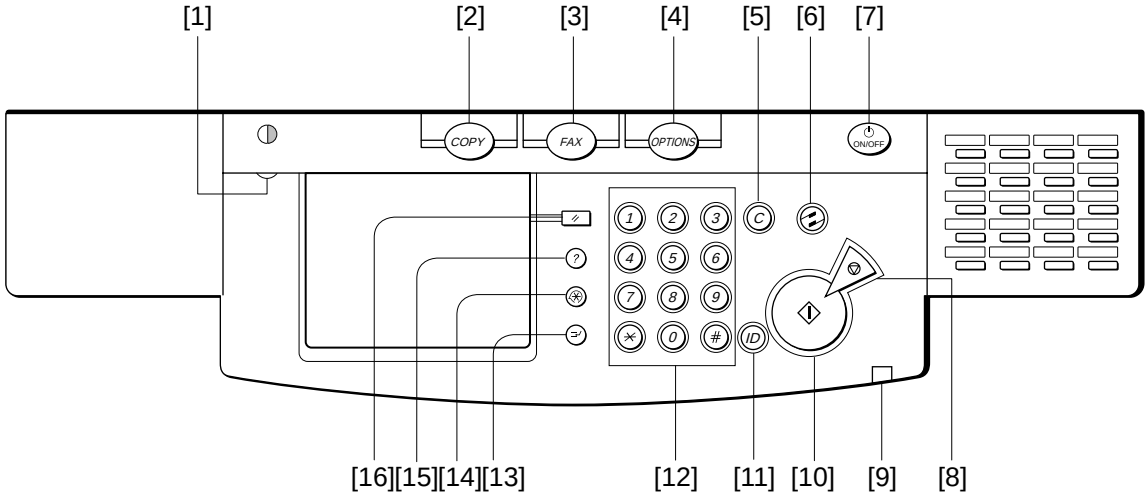
IV. CONTROL PANEL

A. Control Panel

1. Control Panel



[1] Display contrast control
[2] COPY key
[3] FAX key
[4] OPTIONS key
[5] CLEAR key
[6] ENERGY SAVER key
[7] Control panel power switch
[8] STOP key
[9] Power indicator
[10] START key
[11] ID key
[12] Number keys
[13] INTERRUPT key
[14] ADDITIONAL FUNCTIONS key
[15] GUIDE key
[16] RESET key

Figure 1-401

2. Liquid Crystal Display

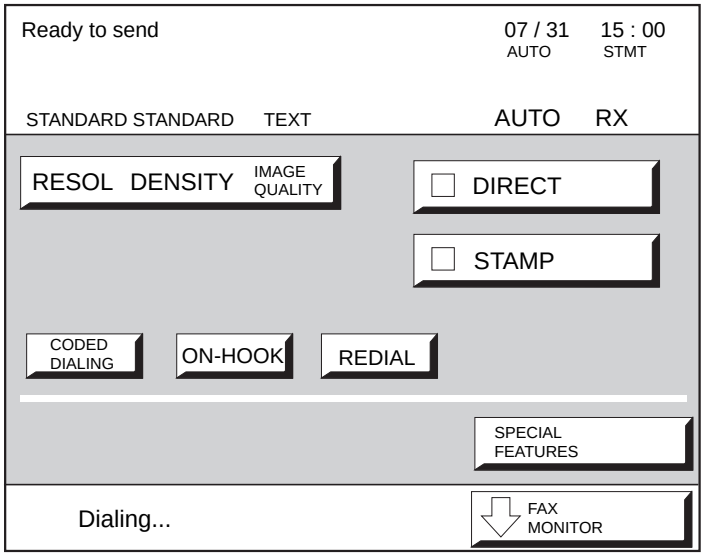


Figure 1-402

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B. Additional Functions / Making FAX Settings

The following diagram shows various fax settings and their factory defaults. For details, see the User's Manual.

USER SETTINGS	
UNIT TELEPHONE #	
UNIT NAME	
SENDER'S NAME	
TX TERMINAL ID	ON
DENSITY CONTROL	5
TEL LINE TYPE	TOUCH TONE
AUDIBLE TONES	
VOLUME CONTROL	
SET DIRECTORY GENERAL CONTENTS	
STANDARD KEY1 SETTING	
STANDARD KEY2 SETTING	
STANDARD SETTINGS	
STORE DESTINATIONS	
ONE-TOUCH DIALING	
CODED DIALING	
GROUP DIALING	
TX SETTINGS	
ECM TX	ON
PAUSE TIME	2SEC
AUTO REDIAL	ON
BATCH TX	ON
ERASE FAILED TX	ON
TIME OUT	ON
STAMP DOCUMENT	DIRECT&MEMORY TX
RAPID DIRECT TX	ON
RX SETTINGS	
ECM RX	ON
INCOMING RING	OFF
MANUAL/AUTO SWITCH	OFF
MEMORY RX	ON
RX PAGE FOOTER	OFF
SYSTEM SETTINGS	
RX RESTRICT	OFF
TX START SPEED	33600 bps
RX START SPEED	33600 bps
RX PASSWORD	
PIN CODE ACCESS	OFF
FILE SETTINGS	
MEMORY BOX STORE/SET	
PRESET POLLING SETTING	OFF
TRANSFER SETTING	OFF
MEMORY LOCK SETTING	OFF

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PRINTER SETTINGS	
# OF RX COPIES	1 COPIES
SELECT CASSETTE	
RX REDUCTION	ON
TWO-SIDED PRINT	OFF
N ON 1 LOG	OFF
REPORT SETTINGS	
TX REPORT	FOR ERROR ONLY
RX REPORT	OFF
MEMORY BOX REPORT	ON
ACTIVITY REPORT	
PRINT LISTS	
1-TOUTCH SPEED DIAL LIST 1	
1-TOUTCH SPEED DIAL LIST 2	
CODED SPEED DIAL LIST 1	
CODED SPEED DIAL LIST 2	
GROUP DIAL LIST	
USER'S DATA LIST	

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C. Common Settings

The following are items that relate to fax functions from those which are used in common by copier and fax systems.

Level 1	Level 2	Factory default	Uses
CUSTOM COMMON SETTINGS	INITIAL FUNCTION	copier	To select the basic screen at power-on (copier or fax).
	SYSTEM DIFF SIZE ORIGINAL	ON	To enable/disable placement of originals of different lengths in sub scanning direction on RDF (other than copier function).
	DRAWER ELIGIBILITY FOR APS/ADS		To enable/disable use of each cassette for cassette auto selection for copier, fax, and printer functions.
	STACK BYPASS	OFF	
	1st	ON	
	2nd	ON	
	TRAY		To assign the special tray of a sorter (accessory) to a function (copier, fax, or printer).
	multi output tray 3		
	A	copier	
	B	fax/printer	
	C	-	
	PRINTING PRIORITY		
	COPY	1	
	FAX	2	
	PRINTER	3	
	SET SYSTEM SETTING PASSWORD	none	To set an ID for the system controller (4 digit max.).
	RESTRICT USE OF FAX WITH CONTROL CARD	no	To specify whether to limit the number of persons given access to the fax using a control card (accessory).
	DEPT. ID MANAGEMENT	no	To specify whether to limit the number of persons given access to the copier or fax or to control the number of sheets used.
	STORE DEPT. ID/PASSWORD	none	To store group ID and ID numbers for group-by-group control.
	COPY TOTALS	User's Manual	To enable counting the sheets used and printing of lists (w/ fax function only) according to group.
TIMER SETTINGS	DATE & TIME SETTINGS	none	To set the current date and time.
	AUTO SLEEP TIME	5 min	To set the time to auto-sleep (1 min to 8 hr; printing is enabled in response to an incoming file even in sleep state).

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D. Master Password

A password may be one used for making various settings for such functions as confidential boxes and memory boxes or one used for group-by-group control.

The one called "master password" is used during servicing work or in the even that the user should forget a particular password.

Caution:

The use of the master password is restricted to the service person. Exercise care not to disclose it to the user.

Mater Password: 4559769

V. POINTS TO NOTE FOR SERVICING

A. Battery Backup

The host copier and the board itself are equipped with a data backup function to protect against loss of data at time of a power outage or when the main power remains off; all data is retained in memory for a specific period of time even when the power is turned off.

	Image processor PCB	
Memory type	Control memory	Image memory
Back-up battery type	Lithium battery	Vanadium lithium secondary battery

The back-up battery used on the board is a vanadium lithium secondary battery capable of backing up image data for about three hours, provided that the copier has previously been powered for three days continuously under normal temperature and humidity conditions.

If the battery fails to back up data half this length of time, it is likely to have reached the end of its life or the environment is likely to have a problem.

The battery ends its service when it has been recharged and discharged (100%) 40 times (at 25ºC). When its life is over, the existing image data will all be lost.

Important:

If you need to turn off the power for servicing work, be sure to print out the image data in advance.

■ Memory Clear List

If a memory clear list has automatically been printed as a result of turning on the host copier, the image data indicated on the list is data the memory failed to back up. The image data retention control information is automatically deleted after printing the list.

Caution:

The lithium battery and the vanadium lithium secondary battery contain flammable properties (lithium, organic solvents). Do not throw them into fire to avoid explosion or combustion. Also, do not disassemble them to avoid damaging the skin by contact with organic solvents. Be sure to dispose of them appropriately (as by separating from others).

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B. Types of Backup Data

1. User Data

The user may press the User Mode key on the control panel and then the Fax Settings key to change the following items.

Item	Description
Basics	User telephone number, and others.
Report settings	Transmission results report, and others.
Transmission settings	ECM transmission, pause length, and others.
Reception settings	ECM reception, reception mode, and others.
Print settings	Cassette selection, image reduction, and others.
Memory control settings	Memory box, forwarding, and others.
System control settings	Transmission start speed, and others.
Dial settings	One-touch dial, speed dial, and others.

2. Service Soft Switches

The service person may make use of service mode to change various settings:
ADJUST, FUNCTION (parts thereof), FAX (settings thereof)

3. Control Data

Control data is data automatically stored in memory recording the operating states of the board.

Item	Description
Communication results	Record of the last 40 communications (transmission/reception).
System dump record	State of past communications, history of error communications, and others.

■ Deletion/Initializing of Data 1, 2, or 3

If any of the above backup data items should be deleted/initialized, all registration data will be lost and all settings will be returned to factory settings.

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4. Image Data Backed Up by the Secondary Battery

The user may press the User Mode key on the control panel and then the Fax Settings key to change the following items.

Item	Communication mode
Transmission image	Transmission (memory transmission, broadcasting transmission)
	Timer transmission
	Timer broadcasting transmission
	Polling transmission
	Relay broadcasting transmission
Reception image	Confidential reception
	Memory reception
	Forced memory reception

C. Printing the Backup Data Information

The data backed up in control memory may be listed and printed out.

Item	List
User data	1-touch speed dial list 1 1-touch speed dial list 2 coded speed dial list 1 coded speed dial list 2 group dial list user's data list
Service soft switch	system data list
Control data	system dump list
	activity report

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D. Removing / Initializing Data in Service Mode

Some data in control memory may be removed/initialized accordingly as described using service soft switch #8 CLEAR. For details, see 11. "Initializing the Settings (#8 CLEAR)" in Chapter 4.

Caution:
Be sure to print out the backup data information list before starting the work.

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I. BASIC OPERATION

A. Functional Construction

The FAX board is controlled by the CPU mounted on the copier's image processor PCB. Further, such fax-related data as service mode settings and user mode settings as well as one-touch dialing/speed dialing data are stored in the RAM on the image processor PCB.

The FAX board provides the following functions:

Basic Functions of the FAX Board

- Controlling communication.
- Controlling the G3 protocol and V.8/V.34 protocol.
- Performing modulation/demodulation (modem) processing.

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B. Control Block (inputs to and outputs from the FAX board)

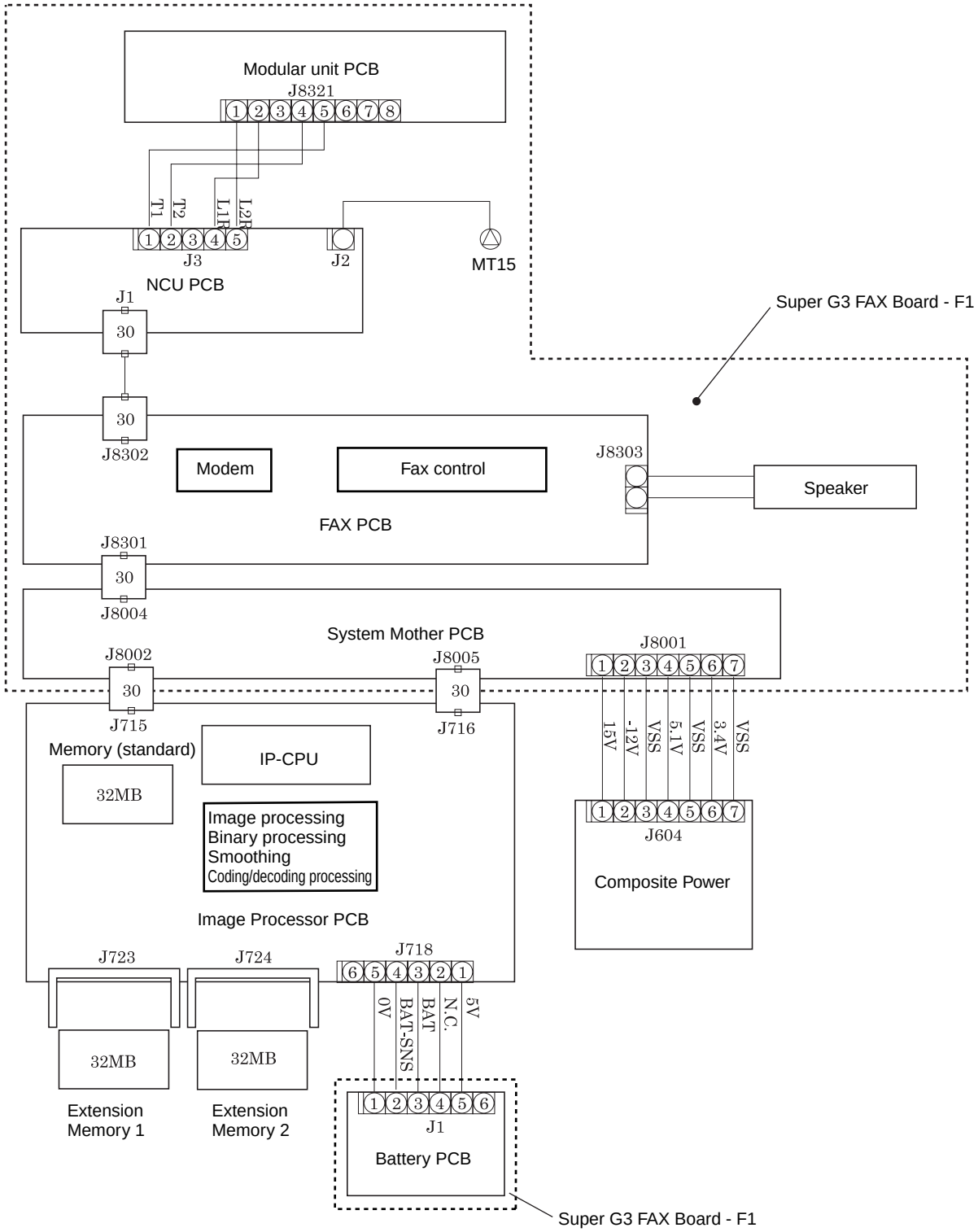

Figure 2-101

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C. Sleep Mode

The board switches among four types of state according to how power is supplied: power-off, sleep 1, sleep 2, and standby.

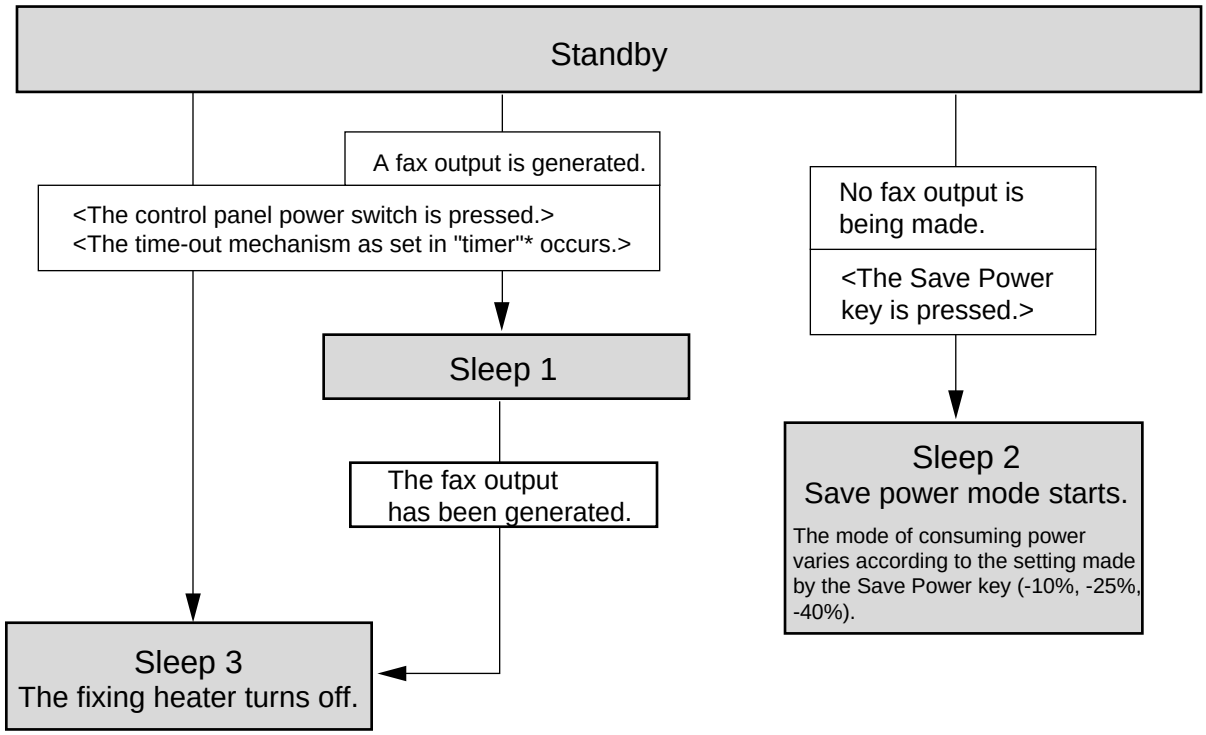
State	IP-CPU*	LCD	Fixing heater	Image memory for fax***	Available operation
Main power off	OFF	OFF	OFF	Retention by battery	None
Sleep 3				Retention by power supply	FAX data transmission/ reception
Sleep 2	ON		Pre-heat		
Sleep 1			ON**		FAX data transmission/ reception, printing
Standby		ON			

*CPU for the image processor PCB.
**Includes the state in which pre-heating mode is ended and the fixing heater reaches a specific temperature.

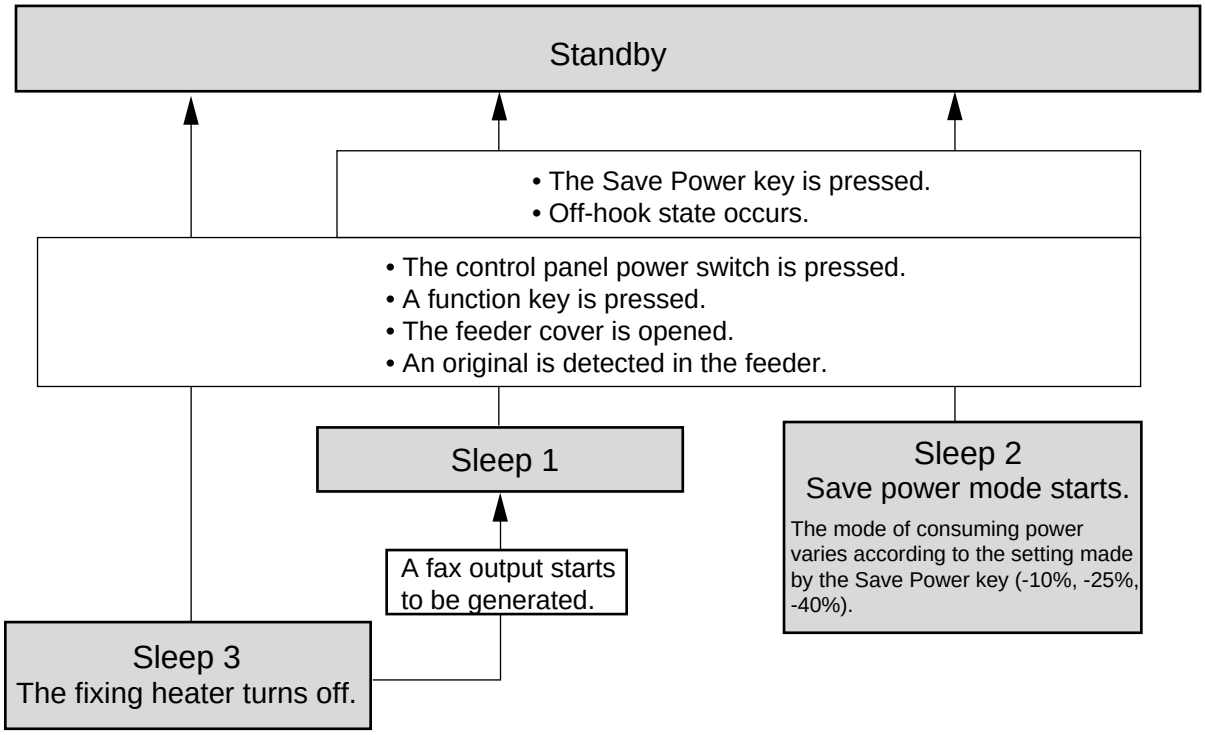
Figure 2-102

2. Transition to Sleep Mode

a. Transition to Sleep Mode



b. Transition from Sleep Mode



* timer: auto power-off time, weekly timer.

Figure 2-103

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D. Control Card

When the control card is used, the following settings may be made to restrict the use of fax functions:

user mode → common setting → fax control card restriction

→ Checks the control card.

The settings made this way apply to fax operations only, and do not affect automatic reception and automatic generation of received files.

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II. READING SYSTEM

A. Reading Originals

1. Feeder

A digital black-and-white copier designed to accommodate the board may be used in combination with the DADF-A1 (document feeder), which is equipped with a stamping function.

reproduction ratio with a feeder in use: 50% to 200%

■ DADF-A1

The DADF-A1 picks up and places originals on the copyboard automatically one by one for reading by the scanner. The originals are placed face-up (i.e., with the printed side facing up), and the topmost page (page 1) of the stack of fax originals is picked up first for transmission.

The pick-up method used by the DADF-A1 may be changed by operating the copier's service mode switch.

To set, operate as follows: COPIER>OPTION>USER>FACE-DWN.

1: picks up and reads the bottommost original of the stack first and returns it to the original tray.

0: picks up and reads the topmost original of the stack first and delivers it to the tray on the right of the DADF-A1.

Figure 2-201 shows the operation when the mode is set to "0."

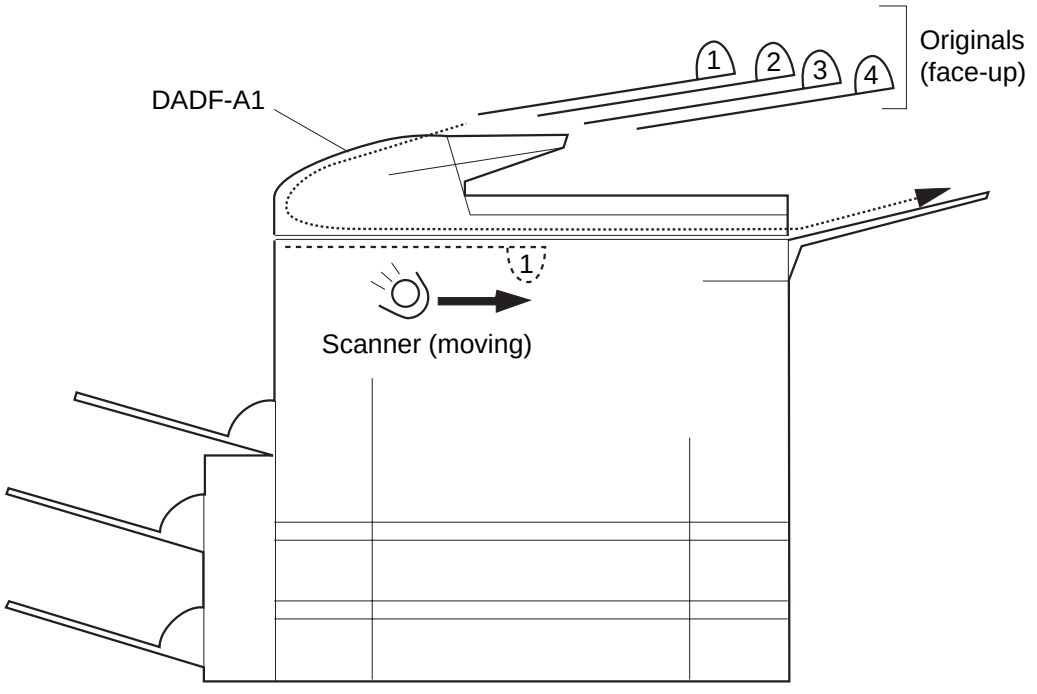

Figure 2-201

2. Copyboard Mode

In copyboard mode, an original is manually placed on the copyboard glass for reading.

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B. Reading Operation

1. Reading for Memory Transmission

Each original placed on the copyboard glass is read and stored in memory. A number of originals may be transmitted in a single communication. When the feeder is used, originals stacked in the feeder are read one after another in sequence.

The originals read in copyboard mode and those read using the feeder cannot be combined.

2. Reading for Direct Transmission

A single original placed on the copyboard glass is read in response to a press on the Start key. If the feeder is used, all originals stacked in the feeder will be read.

As in the case of reading for memory transmission, originals read in copyboard mode and those read using the feeder cannot be combined.

3. Reading Originals of Non-Specified Sizes

Originals are read in respect of the size (A/B-, INCH-configuration) set in service mode (COPIER > OPTION > BODY > MODEL-SZ). If the original in question is of a size different from the specified size, part of its image may not be read or its center may be displaced.

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C. Memory

The copier is equipped with two types of memories: the "page memory" is used to store images (read or received) temporarily for processing in preparation for printing; and the "image memory" is used to store transmission/reception image data after coding.

1. Page Memory

The page memory stores image data which has been processed for reproduction ratio, resolution, image quality, and binary coding according to the selected fax mode. The page memory may be expanded by 23 MB through installation of an accessory memory.

2. Image Memory

The image memory is as large as 32 MB (standard), and is used to store transmission/reception image data after coding (equivalent of about 640 pages of Canon FAX Standard Chart No. 1). The image memory may be expanded by 32 MB or 64 MB (32 + 32 MB) through installation of an accessory memory.

The image memory is backed up by a lithium ion secondary battery, so that its contents may be retained in the event that the copier loses its power because of a power shortage.

When the image memory becomes full during memory transmission or reading operation, the mode will automatically switch to direct transmission. (See "Processing in a Memory Full Condition.")

Caution:

Take note of the following when expanding the image memory:

1. Generate output of the contents of the existing memory.
2. Turn SW2 on the FAX Board off to deprive the image memory of power.
3. Install the additional memory.
4. After the work, turn on SW2 (i.e., slide it to the left).

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The expansion memories of the FAX board are arranged on the copier's image processor PCB.

If you are installing one RAM, be sure to install it to J723. (Using J724 only can cause E604 indication. The expansion memories are available as accessories.)

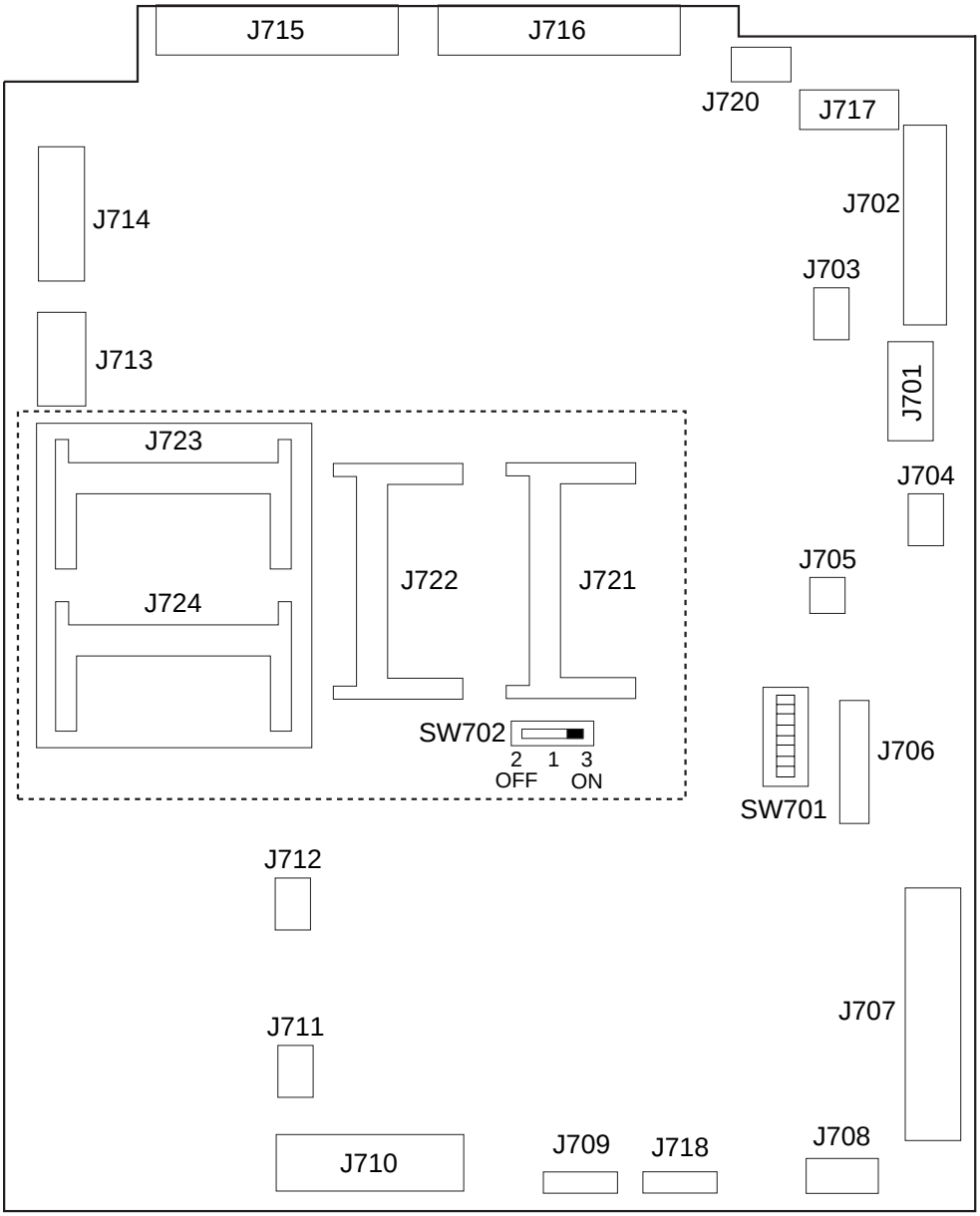

Figure 2-202

	Image memory Minimum to Maximum	Page memory
Standard (32 MB)	About 1 to 10 MB	About 14 MB
+32MB (64MB)	About 1 to 33 MB	About 23 MB
+32MB x 2 (96MB)	About 1 to 66 MB	About 23 MB

Table 2-201

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D. Reading/SENT Stamp (DADF-A1 only)

The stamping mechanism is part of the feeder (DADF-A1), and may be READ stamp or SENT stamp.

A single stamp is used for both, and is designed to put a pink dot 3 mm in diameter.

The stamping mechanism is enabled by operating "transmission settings" of "additional functions." It functions as follows:

- It does not operate in copier, test shot, or copyboard mode.
- It prohibits advance feed when picking up originals.
- It puts a stamp on both originals in 2-on-1 read mode.
- It puts a stamp on the face only when reading a two-sided original.
- It starts direct transmission mode when combined with rapid transmission mode, and uses the SENT stamp.

1. SENT Stamp

   A stamp is put in response to the receipt acknowledge signal from the receiving machine.
   It is available only for direct transmission.

2. READ Stamp

   A stamp is put when the image read by the scanner has been stored in the image memory.
   The location of the stamp when the DADF is used will be as follows:

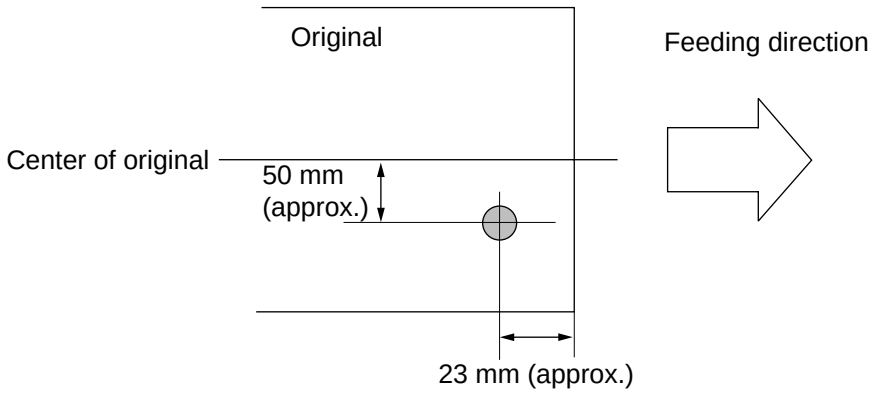

Figure 2-203 Stamp Location (DADF-A1)

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E. Memory Full Condition

1. Outline

If the image memory becomes full while reading is under way for memory transmission (as detected by the CPU on the IP PCB), direct transmission mode will automatically be used starting with the page in question.

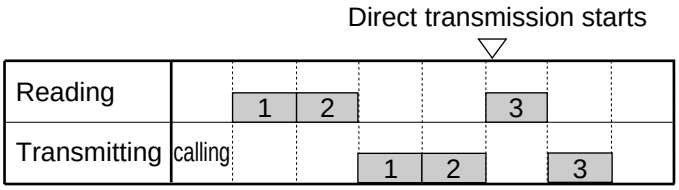
Such modes as timer transmission and broadcasting, which are based on memory transmission, however, cannot rely on direct transmission even if the memory becomes full. In these modes, the image data that occurs after the detection of the condition will be discarded without transmission.

2. Messages

- memory running out
  The message appears when the remaining memory reaches 10% or less. If the size of the upcoming data is less than the remaining memory, storage may be continued.
- memory full
  The message appears when the CPU finds the RAM to be full. After this message has appeared, all transmissions will be direct transmissions.

3. Sequence of Operations

Figure 2-204 shows the sequence of operations that take place when the CPU detects a memory full condition, i.e., shifting to direct transmission mode (3 transmission originals; memory full detected when reading the 3rd page):



1, 2, and 3 indicate the number of originals.

Figure 2-204

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F. Basic Editing Functions

The basic screen for fax mode allows setting a resolution, density, and image quality for reading images.

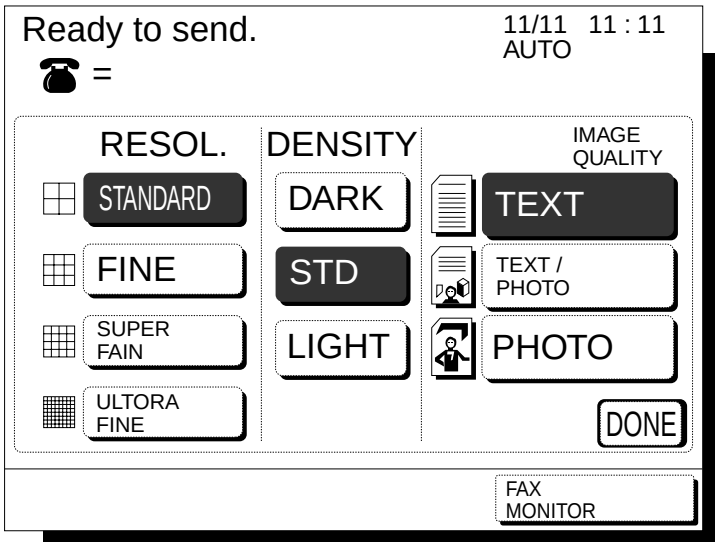

Figure 2-205 Basic Screen for Fax Mode

1. Reading Image Quality/Reading Density

The image quality may be any of three settings: 'text', 'text/photo', or 'photo'. The density, on the other hand, may be any of three settings: 'dark', 'normal', or 'light'.

The images are subjected to binary processing on the image processor PCB according to the image quality selected during reading operation.

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Table 2-202 shows various possible combinations of image quality and density.

Density / Image quality	dark	normal	light
text	ABC = ON AE = OFF slice level = dark	ABC = ON AE = OFF slice level = normal	ABC = ON AE = OFF slice level = light
photo	ABC = OFF AE = OFF correction curve = dark	ABC = OFF AE = OFF correction curve = normal	ABC = OFF AE = OFF correction curve = light
Not possible	Not possible	ABC = OFF AE = OFF correction curve = text/photo	Not possible

Table 2-202

- ABC stands for "Auto Background Control," and is an automatic density adjustment mechanism which places priority on speed.
- AE stands for "Automatic Exposure," and is an automatic density correction mechanism.
- The term "slice level" as used here refers to the level selected for binarization.
- The term "correction curve" as used here refers to any of the correction curves selected when converting multiple-value data to multiple-value density data.

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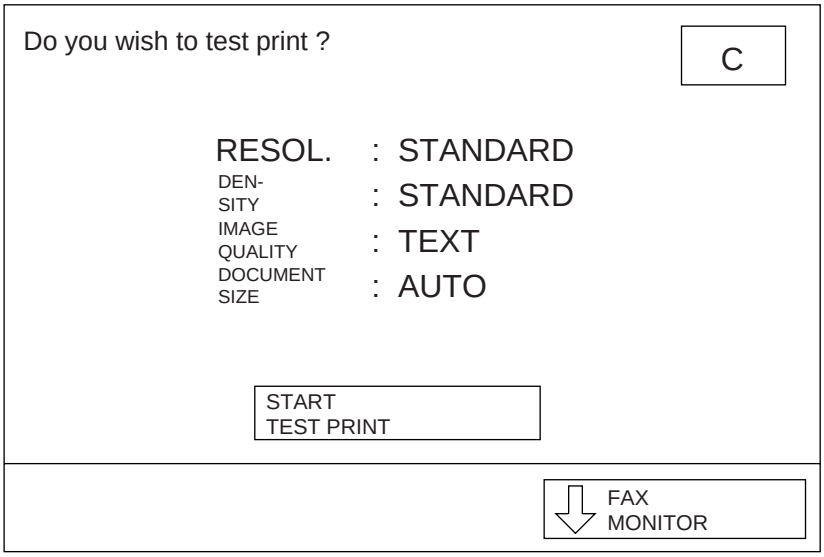
G. Test Shot

In a test shot, an image is read using the same conditions used for actual transmission: the memory is stored in memory once and then printed out. For this reason, the quality and arrangement of the image may be checked prior to actual transmission. It may also be used to look for an error in mechanisms from reading to storing in memory. Figures 2-206 and 2-207 show the Test Shot screen and the flow of image signals, respectively.

The Test Shot screen may be brought up by pressing "SPECIAL FEATURES" and then "TEST PRINT."



Note that the resolution, density, and image quality are determined according to the settings made on the Fax Basic screen.

Figure 2-206 Test Shot Screen

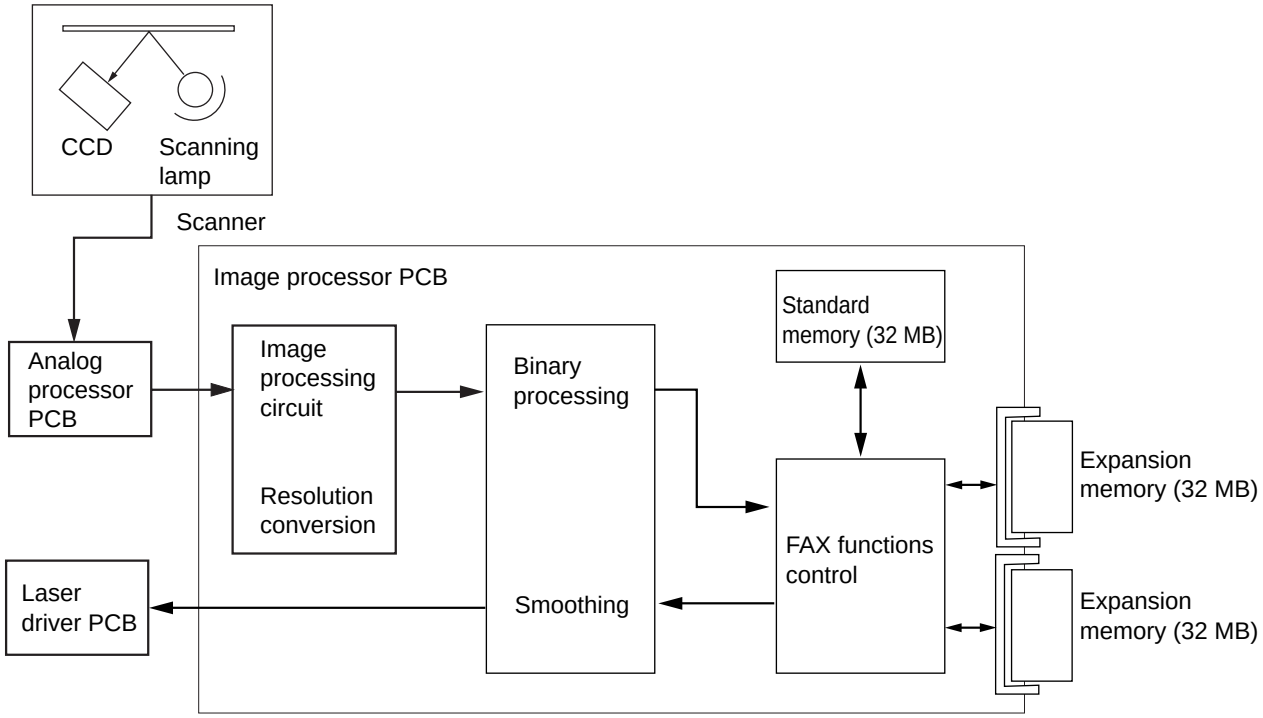


Figure 2-207 Flow of Image Signals in Test Shot Mode

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H. Reduction/Enlargement

Images are processed for reduction/enlargement by the image processor for both transmission and reception. For ratios, see Table 2-203.

	Ratio
Transmission	50% to 200%
Reception	97%, 95%, 90%, 75% (as set in user mode and service mode)

Table 2-203 Reduction/Enlargement for Transmission/Reception

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III. RECORDING SYSTEM

When images are received, the following mechanisms are used to print them out:

A. Recording System

1. Settings Related to the Recording System

The recording system used to record reception images on recording paper covers the following items, which may be set to suit the needs of the user:

1. Cassette Selection Switch A, B, C, D (fax specifications settings)
   a. enable/disable dividing and recording on paper of the same configuration
   b. enable/disable creating a margin and recording on paper of the same configuration
   c. enable/disable dividing and recording on paper of a different configuration
   d. enable/disable creating a margin and recording on paper of a different configuration
2. automatic reduction and recording on receiving machine/fixed reduction and recording on receiving machine (image reduction under fax specifications settings)
3. reception footer function (reception information recording under fax specifications settings)
4. forced memory mode (printing prohibition under fax specifications settings)
5. multiple sets output (reception printing quantity under fax specifications settings)
6. reception start function (reception printing under fax specifications settings)
7. reduction recording prohibition to A4 or LTR (service data #7)
8. LTR/LGL priority (service data #7)
9. sub scanning priority recording (service data #7)
10. n-on-1 recording (n-on-1 recording under fax specifications settings)
11. delivery tray selection (two-sided recording under fax specifications settings)
12. rotation recording
13. delivery tray selection (common settings)
14. recording cassette selection (common settings)

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1.1 Cassette Switch A, B, C, D

For details, see 2. "Selecting Recording Paper" on p. 2-24.

1.2 Receiving Side Automatic/Fixed Reduction for Recording

a. Receiving Side Automatic Reduction for Recording
If the page of received data is longer than the default page, the image will be reduced (within the specified maximum reduction ratio) for recording so that the page will not be divided.

b. Receiving Side Default Reduction for Recording
All received pages are always reduced for recording.

ADDITIONAL FUNCTIONS > CUSTOM FAX SETTINGS > PRINTER SETTINGS > RX REDUCTION

1.3 Reception Footer Function

The reception footer function adds the date and time of reception, and sequential and page numbers to the trailing edge of each recording sheet. This function is used for received images only, and does not apply to test shot mode or stored images. The size of the footer varies according to the selected resolution: it is about 4 mm at standard resolution, and about 3 mm in other resolutions.

The reception footer is added to the trailing edge (within the effective recording area) of each recording sheet regardless of the length of the reception page. When a footer is added, the reception page recording will be smaller than otherwise.

ADDITIONAL FUNCTIONS > CUSTOM FAX SETTINGS > RX SETTINGS > RX PAGE FOOTER

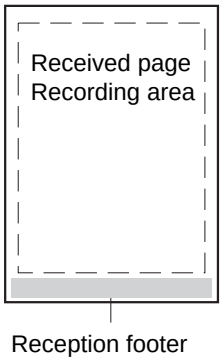

Figure 2-301

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1.4 Forced Memory Reception

This function operates to store received images in memory without printing.

ADDITIONAL FUNCTIONS > CUSTOM FAX SETTINGS > FILE SETTINGS > MEMORY LOCK SETTING

1.5 Multiple Quantity Output (reception printing quantity)

This function operates to generate received images for a specified quantity.
The function is effective for confidential, relay, and forced memory modes.

1.6 Reception Sort Printing

This function operates to receive and store all pages of a single communication in memory, and then generates the file starting with the last page.

If the copier is equipped with a face-down delivery mechanism, the output will be in the order of reception regardless of the settings made as part of user data (no reception sort). In n-on-1 mode, reception sort will not be performed.

(The foregoing becomes effective according to COPIER>OPTION>USER>FAX-PRT in service mode.)

ADDITIONAL FUNCTIONS > CUSTOM FAX SETTINGS > PRINTER SETTINGS > RX REDUCTION

1.7 Reduction Prohibition to A4/LTR

This function operates to prohibit reduction to A4/LTR paper even if the received image (A-configuration) falls within the reduction range. The function prohibits automatic reduction to A4 or LTR only, and allows automatic reduction to other sizes.

Service Soft Switch Settings
#7 PRINTER SW05: yes, no

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1.8 LTR/LGL Priority

This function operates to place priority on LTR or LGL over A4 when recording A-configuration received pages.

This function may be enabled using a service soft switch (#7 PRINTER) for LTR and LGL independently of each other.

1.9 Sub Scanning Priority

This function operates to place priority on a sheet with a long sub scanning side having the same width as the received page.

For instance, if B4 and A4 sheets are set when an A4 page with a long side is received (A4 reduction prohibited, sub scanning direction B4 or less), this function avoids division into A4 but records on a single B4 sheet.

1.10 n-On-1 Recording

This function operates to combine received pages with a short sub scanning side. The function prints as many as three pages on a single sheet, provided the following conditions exist:

- In user mode, n-on-1 is enabled.
- The recording paper is not the same size as the received page, but can accommodate as many as *n* pages.
- The resolution of the n pages is an appropriate resolution.
- The combined sub scanning lengths of n pages fit a single recording sheet.

1.11 Two-Sided Recording

This function operates to record two received pages on a single recording sheet.

ADDITIONAL FUNCTIONS > CUSTOM FAX SETTINGS >
PRINTER SETTINGS > TWO-SIDED PRINT, N ON 1 LOG

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1.12 Selecting the Delivery Tray

This function enables the selection of a tray for delivery if the Multi Output Tray-3 is installed. Select a tray in user mode (common settings).

1.13 Pick-Up Cassette Selection (turning on/off cassette auto selection)

This function operates to select the cassette used as the source of recording sheets. The function specifies a cassette size, and is also used to specify a paper size for reception.

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2. Selecting Recording Sheets

a. Outline

When the default service data is effective, recording sheets are selected based on the cassette selection switch settings (A through D) in reference to the following descriptions:

Priority	Description	Remarks
1	Sheet whose main scanning length is the same as the print size length and which can accommodate all the image.	If it takes multiple sheets to print all the image, a sheet whose sub scanning length is closest to the print size length (minimum size) will be selected.
2	Sheet whose main scanning length is not the same as the print size length but can accommodate all the image.	
3	Sheet whose main scanning length is the same as the print size length and which allows a minimum number of divisions.	If it takes multiple sheets to print all the image and if different sheets allow a minimum number of divisions, the sheet with the shortest sub scanning length will be selected. The second and subsequent pages will be printed on the same type of sheet.
4	Sheet whose main scanning length is not the same as the print size length but which allows a minimum number of divisions.	

Reference:

If sheets of the same size are set, the order of priority will be as follows:

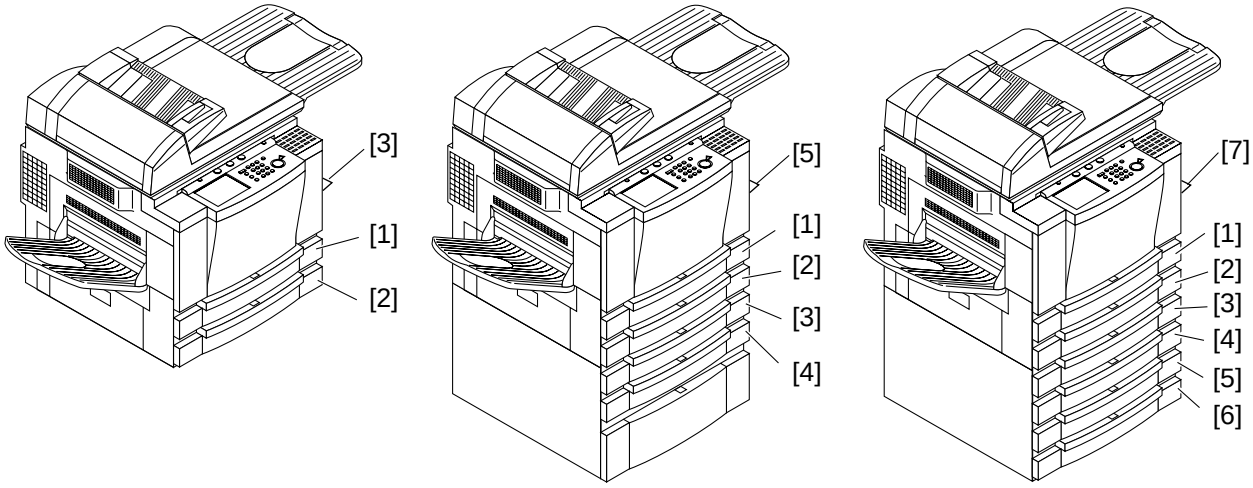

Figure 2-302 (DADF-A1 Model)

- If the selected sheets run out during printing, the sheets with the second priority will automatically be selected.
- If no sheet exists for printing, memory reception will be used.

b. Cassette Selection Switch

This function operates to select specific recording sheets to suit the needs of the user. As many as four cassette selection switches (A through D) exist as described in the following table.

If printing on recording sheets of the same size as the received pages is desired, be sure to shift all cassette size switches A through D to OFF.

Switch (function)	Description
Switch A (divide and record on paper of same configuration)	Enables (ON) or disables (OFF) dividing and recording on sheets of the same configuration but whose sub scanning direction is shorter than received pages (default size image).
Switch B (create margin and record on paper of same configuration)	Enables (ON)/disables (OFF) creating a margin and recording on sheets of the same configuration but one size larger than the received page.
Switch C (reduce and record B image on A paper)	Enable (ON)/disables (OFF) reducing and recording pages of B-configuration on sheets of A configuration.
Switch D (reduce and record A page on B paper)	Enables (ON)/disables creating a margin and record received pages of A configuration on sheets of B configuration.

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c. Recording Paper

The FAX Board automatically selects the first recording sheet (cassette) that satisfies the following conditions; if none of the conditions is met, the board indicates a message to that effect, and starts memory reception (waiting for output).

Priority	Description
1	Has the same main scanning length. Is smallest of those capable of accommodating all the image (in Direct or by reduction up to maximum ratio).
2	Has the same main scanning length. Is the smallest of those capable of accommodating images after discarding as much of the image as allowed (in Direct).
3	Has the same main scanning length. Is the smallest of those capable of accommodating all the image with the least number of divisions.
4	Has a greater main scanning length. Is the smallest of those capable of accommodating all the image (in Direct).
5	Accommodates all the image by fixed reduction.
6	Has a greater main scanning length. Is the smallest of those capable of accommodating all the image with the least number of divisions (in Direct).
7	Accommodates all the image with the least number of divisions (by fixed reduction).

Reference:

1. If several cassettes contain the sheets of the same size, priority will be given to A4 over A4R (priority on printing speed). Further, a higher cassette will be given priority over a lower one.
2. If division is performed, the second and subsequent pages will be printed on sheets.
3. If all of the following conditions are met, n-on-1 recording will be executed:
   - "n-on-1 record" is selected as part of user data.
   - The main scanning length of n received pages is the same.
   - The resolution of the n received pages is the same.
   - The combined sub scanning lengths of n received pages fit a single page.
4. If all of the following conditions are met, two-sided recording will be executed.
   - "two-sided recording" is set to "Yes" as part of the user data.
   - Each pair of received pages is of the same size as the sheets in the selected cassette.
   - Each pair of received pages is part of a single communication.
5. In addition, service switches may be used to prohibit reducing and printing to A4, prohibiting reducing and printing to LTR, giving priority to sub scanning, giving priority to LTR, and giving priority to LGL.

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d. Priority of Selecting a Recording Paper Type

The priority of printing or printing mode is determined according to the settings of the service soft switch and recording paper size in addition to the selected combination of the cassette selection switches A through D (user data).

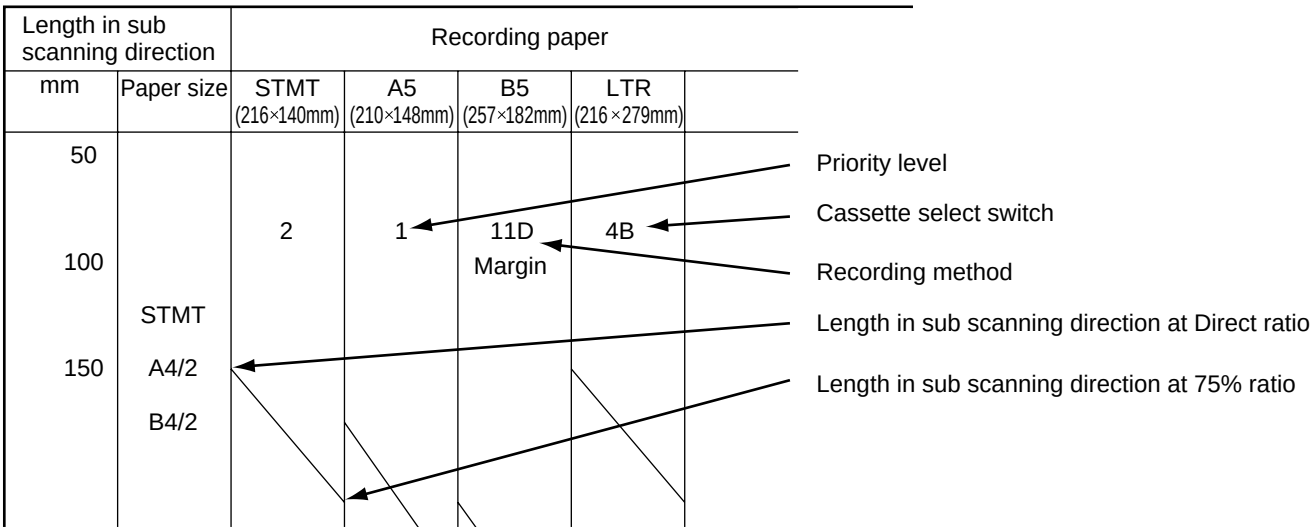
Guide to the Charts

(1) Selects the appropriate table with reference to the length of the page in main scanning direction.

- If it is A4 in main scanning direction
- If it is B4 in main scanning direction
- If it is A3 in main scanning direction
- If it is a report

(2) Checks the data for each cassette containing recording paper in reference to the length of the page in sub scanning direction (vertical axis). The notations used in the charts (frames) indicate the following:

- Alphabet Characters (A through D)
  Correspond to the cassettes A through D selected by the user soft switch. The absence of a notation is interpreted as the absence of constraining conditions.
- Numbers
  Represent the levels of priority, with a lower number indicating a higher priority.
- Margin
  Indicates that recording will be executed with a margin in main scanning direction.
- Divide
  Indicates that recording will be executed by dividing the data into multiple pages.
- Default Reduction
  Indicates that recording will be by reduction (as from B4 to A4).



(3) The recording paper satisfying the conditions given in (2) and with the highest priority level is used. If none satisfies the conditions, memory reception will be selected and no output is generated.

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a. Main Scanning Length Is A4 (210 mm)

Length in sub scanning direction		Recording paper								
mm	Paper size	STMT (216×140mm)	A5 (210×148mm)	B5 (257×182mm)	LTR (216×297mm)	A4 (210×297mm)	LGL (216×356mm)	B4 (257×364mm)	A3 (210×420mm)	11×17 (216×432mm)
50		2	1	11D Margin	4B	3B	5B	5B Margin	5B Margin	5B Margin
100										
	STMT									
150	A4/2									
	B4/2									
200										
	A5,A3/2				4	3				
250										
	B5									
	LTR									
300	A4									
	LGL									
350										
	B4				7A Divide		5			
400										
	A3 LGR									
450										
500		10A Divide	9A Divide	18AD Divide Margin	7 Divide	6 Divide	8 Divide			
550								17AD Margin Divide	16AD Margin Divide	15AD Margin Divide
600										

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b. Main Scanning Length Is A4 (210 mm; A4 recording paper reduction recording prohibited)

Length in sub scanning direction		Recording paper								
mm	Paper size	STMT (216×140mm)	A5 (210×148mm)	B5 (257×182mm)	LTR (216×279mm)	A4 (210×297mm)	LGL (216×356mm)	B4 (257×364mm)	A3 (210×420mm)	11×17 (216×432mm)
50		2	1	11D Margin	4B	3B	5B	12D Margin	13D Margin	14D Margin
100										
	STMT									
150	A4/2									
	B4/2									
200										
	A5,A3/2				4	3				
250										
	B5									
	LTR									
300	A4									
	LGL									
350										
	B4				7A Divide		5			
400										
	A3 LGR									
450										
500		10A Divide	9A Divide	18AD Margin Divide	7 Divide	6 Divide	8 Divide			
550										
								17AD Margin Divide	15AD Margin Divide	15AD Margin Divide
600										

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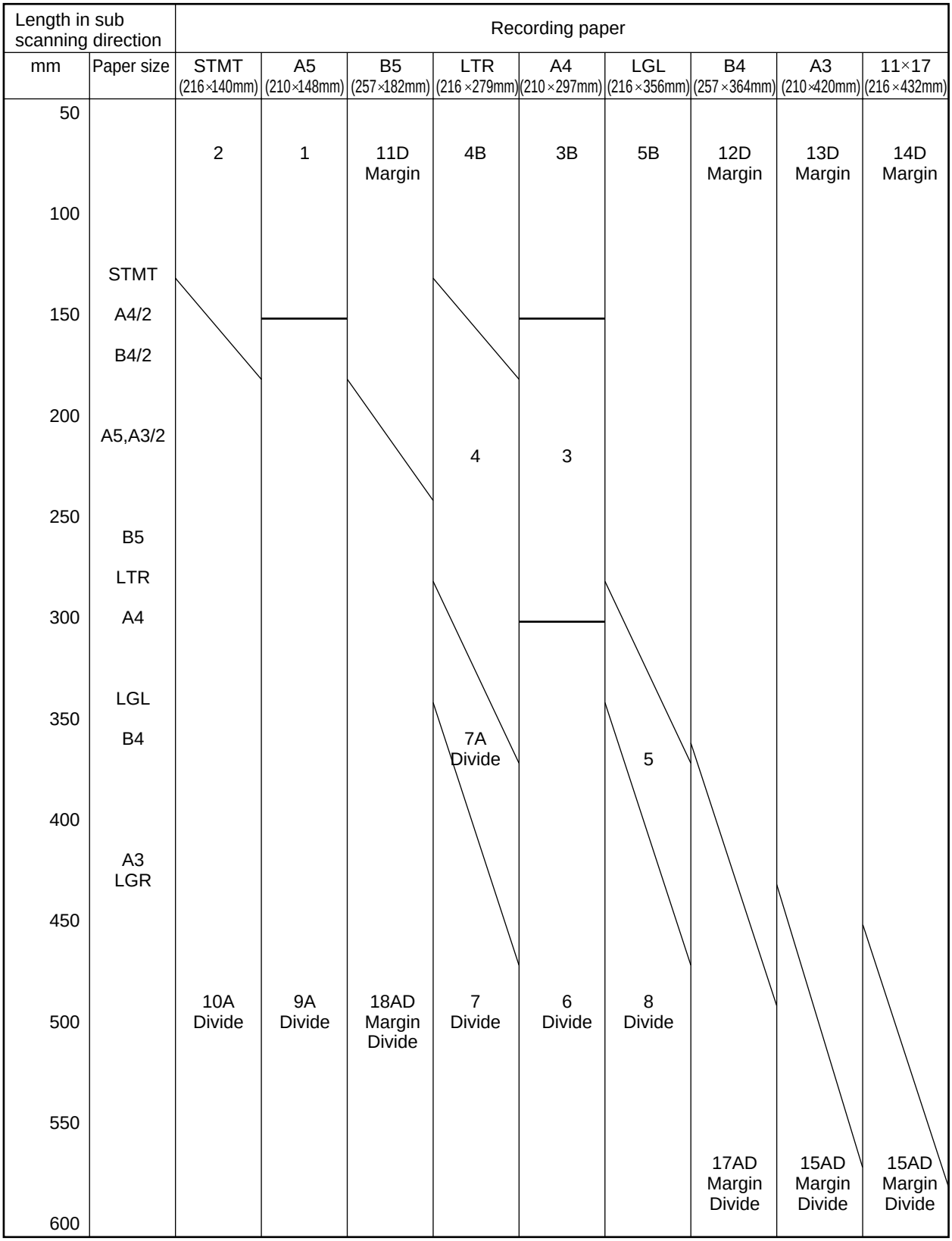
c. Main Scanning Length Is A4 (210 mm; LTR recording paper reduction recording prohibited)



d. Main Scanning Length Is A4 (210 mm; priority on LTR/LGL)

Length in sub scanning direction		Priority on LTR			Priority on LGL			Priority on LTR + LGL		
mm	Paper size	LTR (216 ×279mm)	A4 (210× 297mm)	LGL (216 ×297mm)	LTR (216× 279mm)	A4 (210 ×297mm)	LGL (216 ×297mm)	LTR (216 ×279mm)	A4 (210×297mm)	LGL (216 ×297mm)
50		3B	4B	5B	4B	5B	3B	3B	5B	4B
100										
	STMT									
150	A4/2									
	B4/2									
200										
	A5,A3/2	3	4		4	3		3	5	
250										
	B5									
	LTR									
300	A4									
	LGL			5						
350	B4	6A Divide			7A Divide		3	6A Divide		4
400										
	A3 LGR									
450										
500		6 Divide	7 Divide	8 Divide	7 Divide	8 Divide	6 Divide	6 Divide	8 Divide	7 Divide
550										
600										

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e. Main Scanning Length Is A4 (210 mm; priority on sub scanning)

Length in sub scanning direction		Recording paper								
mm	Paper size	STMT (216×140mm)	A5 (210×148mm)	B5 (257×182mm)	LTR (216×279mm)	A4 (210×297mm)	LGL (216×356mm)	B4 (257×364mm)	A3 (210×420mm)	11×17 (216×432mm)
50		2	1	6D Margin	4B	3B	5B	7D Margin	8D Margin	9D Margin
100										
	STMT									
150	A4/2									
	B4/2									
200										
	A5,A3/2				4	3				
250										
	B5									
	LTR									
300	A4									
	LGL									
350										
	B4						5			
400										
	A3 LGR									
450										
500		17A Divide	16A Divide	18AD Margin Divide	11Divide	10Divide	12 Divide			
550										
								13AD Margin Divide	14AD Margin Divide	15AD Margin Divide
600										

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f. Main Scanning Length Is B4 (257 mm)

Length in sub scanning direction		Recording paper								
mm	Paper size	LTR (216 ×279mm)	A4 (210× 297mm)	LGL (216 ×297mm)	LTR (216× 279mm)	A4 (210 ×297mm)	LGL (216 ×297mm)	LTR (216 ×279mm)	A4 (210×297mm)	LGL (216 ×297mm)
50		2	1	11C Default reduction	4B	3B	5B	12D Margin	13D Margin	14D Margin
100										
	STMT									
150	A4/2									
	B4/2									
200										
	A5,A3/2				4	3				
250										
	B5									
	LTR									
300	A4									
	LGL									
350										
	B4				7A Divide		5			
400										
	A3 LGR									
450										
500		10A Divide	9A Divide	18AC Default reduction Divide	7 Divide	6 Divide	8 Divide			
550										
								17AD Margin Divide	16AD Margin Divide	15AD Margin Divide
600										

Note: If this mode is used, the output will be limited to A4 even when a B5 cassette exists.

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g. B4 in Main Scanning Direction

Length in sub scanning direction		Recording paper								
mm	Paper size	STMT (216 ×140mm)	A5 (210× 148mm)	B5 (257 ×182mm)	LTR (216× 279mm)	A4 (210 ×297mm)	LGL (216 ×356mm)	B4 (257 ×364mm)	A3 (210 ×420mm)	11× 17 (216 × 432mm)
50		No output	No output	No output	9C Default reduction	1	10C Default reduction	6C Default reduction	2B	3
100										
150	STMT A4/2 B4/2									
200	A5,A3/2									
250	B5 LTR					8A Divide or 7A Default reduction		2		
300	A4									
350	LGL B4									
400	A3 LGR				12AC Default reduction Divide	6A Divide	13AC Default reduction Divide	11AC Default reduction Divide	5 Divide	4 Divide
450										
500										
550										
600										

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h. B4 in Main Scanning Direction (priority on sub scanning direction)

Length in sub scanning direction		Recording paper								
mm	Paper size	LTR (216 ×140mm)	A5 (210× 148mm)	B5 (257 ×182mm)	LTR (216× 279mm)	A4 (210 ×297mm)	LGL (216 ×356mm)	B4 (257 ×364mm)	A4 (210 ×420mm)	11× 17 (216× 432mm)
50		No output	No output	1	9C Default reduction	2D Margin	10C Default reduction	3B	7D Margin	5 Margin
100										
	STMT									
150	A4/2									
	B4/2									
200										
	A5,A3/2									
250										
	B5									
	LTR									
300	A4					8C Default reduction		3		
	LGL									
350										
	B4									
400										
	A3 LGR									
450										
				4A Divide	13AC Default reduction Divide	12AC Default reduction Divide	14AC Default reduction Divide			
500										
550								3 Divide	11AD Margin Divide	6 Margin Divide
600										

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i. Main Scanning Length Is A3 (297 mm)

Length in sub scanning direction		Recording paper								
mm	Paper size	LTR (216 ×140mm)	A5 (210× 148mm)	B5 (257 ×182mm)	LTR (216× 279mm)	A4 (210 ×297mm)	LGL (216 ×356mm)	B4 (257 ×364mm)	A3 (210 ×420mm)	11× 17 (216 × 432mm)
50		No output	No output	1	10C Default reduction	2D Margin	11C Default reduction	3B	5D Margin	4 Margin
100										
	STMT									
150	A4/2									
	B4/2									
200										
	A5,A3/2									
250										
	B5									
	LTR									
300	A4					9C Default reduction		3		
	LGL									
350										
	B4									
400										
	A3 LGR									
450										
500				15A Divide	13AC Default reduction Divide	12AC Default reduction Divide	14AC Default reduction Divide			
550								7Divide	8AD Margin Divide	6 Margin Divide
600										

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Report

Length in sub scanning direction		Recording paper								
mm	Paper size	STMT (216 ×140mm)	A5 (210 ×148mm)	B5 (257 ×182mm)	LTR (216 ×279mm)	A4 (210 ×297mm)	LGL (216 ×356mm)	B4 (257 ×364mm)	A3 (210 ×420mm)	11× 17 (216 ×432mm)
	Not relevant	No output	No output	No output	2	1	3	4	5	6

Report (priority on LTR)

Length in sub scanning direction		Recording paper								
mm	Paper size	STMT (216 ×140mm)	A5 (210 ×148mm)	B5 (257 ×182mm)	LTR (216 ×279mm)	A4 (210 ×297mm)	LGL (216 ×356mm)	B4 (257 ×364mm)	A3 (210 ×420mm)	11× 17 (216 ×432mm)
	Not relevant	No output	No output	No output	1	2	3	4	5	6

Caution:

In report mode, the output will be on a single sheet of paper without extra-length processing even if the data has an image (e.g., transmission result report).
If the image is longer in main scanning direction than the recording paper, the extra area will be lost. As can be learned from the table, selection is made regardless of the size of the image added.

Report (B5 reduction)

Length in sub scanning direction		Recording paper								
mm	Paper size	STMT (216 ×140mm)	A5 (210 ×148mm)	B5 (257 ×182mm)	LTR (216 ×279mm)	LTR (216 ×140mm)	A4 (210 ×297mm)	LGL (216 ×356mm)	B4 (257 ×364mm)	11× 17 (216 ×432mm)
	Not relevant	No output	No output	Reduced printing	2	1	3	4	5	6

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B. Image Rotation

In image rotation, a received image is rotated automatically to suit the orientation of the existing recording paper for printing; an image may be rotated by 90º or 180º.

1. Normal Rotation (surface recording)

The image is rotated 0º or 90º based on the combination of the orientation of the received image (main scanning direction) and the orientation of the recording paper.

		Recording paper							
		A5R	A5	B5R	B5	A4R	A4	B4	A3
Main scanning direction	A4R	90°	0°	90°	0°	0°	90°	0°	0°
	B4	×	×	90°	0°	0°	90°	0°	0°
	A3	×	×	×	×	90°*	0°*	0°	0°

Note: The paper sizes are shown in the way they are presented on p. 2-25 (i.e., A4 is 210 mm long in main scanning direction).

* If an A3 page (297-mm, length in main scanning direction) is received by reduction to A4, it will be treated as if it is an A4R (length in main scanning direction).

2. Rotation for Double-Sided Recording

Rotation of an image for printing on the back of a double-sided sheet depends on whether the image on the face has been rotated or not.

	Face not rotated	Face rotated
Face	0°	90°
Back	180°	90°

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IV. COMMUNICATION SYSTEM

A. Image Signal Transmission Speed

1. Image Signal Transmission Speed (transmitting)

The FAX Board provides the following image signal transmission speeds: at V.34, 33.6 kbps, 31.2 kbps, 28.8 kbps, 26.4 kbps, 24.0 kbps, 21.6 kbps, 19.2 kbps, 16.8 kbps, 14.4 kbps, 12.0 kbps, 9.6 kbps, 7.2 kbps, 4.8 kbps, and 2.4 kbps.

		Declaration by receiving machine		
		← Higher	Order of priority	Lower →
		V.34	V.17	V.33
Device transmission speed setting	V.34 (max) Auto (V.34)	V.34 33.6K (MAX)	V.17 14.4K	V.33 14.4K
	14.4K	V.17 14.4K	V.17 14.4K	V.33 14.4K
	12K	V.17 12K	V.17 12K	V.33 12K
	TC9600	TC9600	TC9600	TC9600
	TC7200	TC7200	TC7200	TC7200

Note:

1. If speeds are identical, V.17 and then V.33 will be given priority.
2. In abbreviated protocol mode, V.17 is prohibited.
3. If both transmitting and receiving machines use V.34, the most appropriate speed will be selected automatically.

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2. Image Signal Transmission Speed (receiving)

The FAX Board provides the same transmission speed when receiving images as when transmitting images (33.6 kbps to 2.4 kbps).

		Declaration by receiving machine
Device transmission speed settings	V.34 (2.4 K to 33.6 K) (automatically set)	V.27ter + V.29 + V.33 + V.17 + V.34
	14.4K	V.27ter + V.29 + V.33 + V.17
	12K	V.27ter + V.29 + V.33 + V.17
	TC9600	V.27ter + V.29 + V.33 + V.17
	TC7200	V.27ter + V.29 + V.33 + V.17
	9600	V.27ter + V.29
	7200	V.27ter + V.29
	4800	V.27ter
	2400	V.27ter fallback mode

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B. Canon Express Protocol (CEP)

1. Transmission

- For one-touch/speed dial transmission, the image transmission speed as determined by the effective transmission method will be used.
- For keypad dial transmission, the transmission start speed as determined by the system control function will be used.

	Image transmission speed by transmission method (one-touch/speed dial transmission)		Transmission start speed of system control function (keypad dial transmission)	
	33600bps	14.4kbps 9.6kbps 4.8kbps	33600bps	14.4kbps 9.6kbps 7.2kbps 4.8kbps 2.4kbps
CEP	Yes	No	No	No
CEP II				

2. Reception

- The transmission start speed as determined by the system control function will be used.

	Reception start speed as determined by system control function	
	33.6kbps	14.4kbps 9.6kbps 7.2kbps 4.8kbps 2.4kbps
CEP	Yes	No
CEP II	No	

Reference:

CEP II is the result of modifying the pre-procedure of the canon express protocol with a view to reducing communication time. It uses the same high-speed protocol and post-procedure as CEP.

CEP II is effective only between Canon machines equipped with the function. If a machine is equipped with CEP only, control will automatically be switched to CEP.

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C. JBIG Image Compression Coding Method

1. Outline of the JBIG Image Compression Coding Method

The JBIG image compression coding method is a new way of coding binary image data (black and white) developed by the Joint Bi-Level Image Experts Group, and its rules are standardized as part of ITU-T T.82/5.85.

The JBIG image compression coding method provides a higher rate of compression than the existing MMR coding method (1.1 to 30 times as high) when handling text, pseudo halftone with limited black-and-white continuity, and halftone processed by a dither method. It can also be characterized by the fact that the size of coding after compression will not exceed the initial size of data and by its ability to reproduce original images progressing during decoding as in the case of the existing MR/MMR method (i.e., fully reversible).

The JBIG image compression coding method is either of two types: progressive bi-level image compression designed for image data base searches (standardized in ITU-T T.82) and single progressive sequential bi-level image compression designed for fax communication (standardized in ITU-T T.82 and T.85). Figure 2-401 shows conceptual diagrams of these two methods.

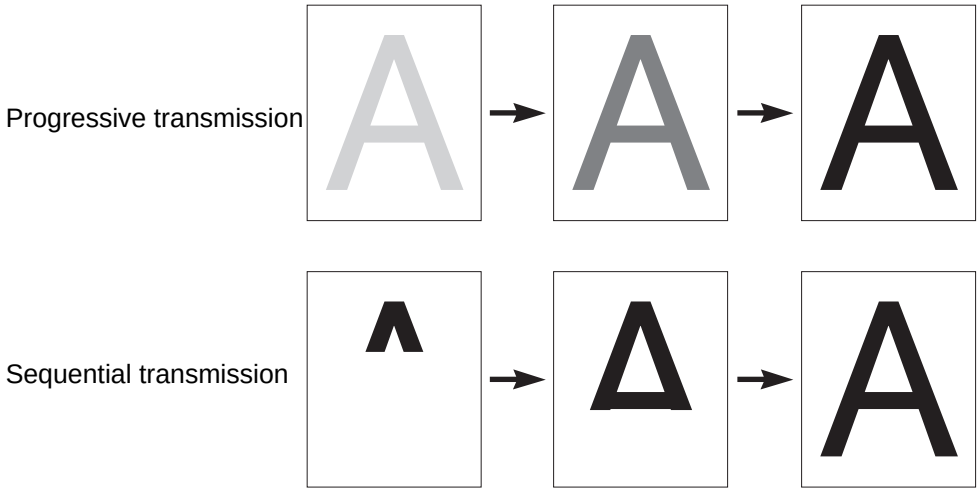

Figure 2-401 Conceptual Diagrams

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Reference:

The following is an outline of the progressive bi-level image compression method:
An original image is read at a high resolution. The result is converted to a low resolution, and the resulting data is coded (compressed) and transmitted. The data is such that, upon reception, it immediately provides an overall "impression" of the original image, although at a low resolution.
Data used to improve the resolution of the image contained in the previously sent data follows. Using this data, the previously sent data (low resolution) is decoded on the receiving side. As decoding progresses, the initial low-resolution image will taken on a higher resolution.
In practical uses, the receiving side (e.g., CRT screen) can immediately recognize the image, and can monitor it while the image as the resolution increases. As needed, the receiving side may suspend reception of the image at any time.
This method of image compression is based on low-resolution images to code high-resolution images, and requires a page buffer to hold low-resolution images.

2. Single Progression Sequential Bi-Level Image Compression

The following is an outline of the single progression sequential bi-level image compression method.

While the progressive bi-level image compression method uses multiple layers of resolution on a page basis (from low-resolution layer to high-resolution layer) for coding and decoding, the single progression sequential bi-level image compression codes an image from left to right and from top to bottom in units of horizontal bands (or lines) referred to as "stripes" (hence, the name "sequential"). This method is called "single progression" because it codes and decodes on the basis of a single resolution layer.

Reference:

In this method, data is coded in units of stripes, so that it requires a far smaller buffer than a page buffer.

An image is coded and the resulting coded image data is organized as follows:

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3. Coding an Image

In the single progression sequential bi-level image compression method, a coding device is used to code an image based on the result of comparison between the current line and the immediately preceding line and on the result of prediction about the level of the pixel in question using a model template (to find out whether it will be white or black).

The learning table used for prediction is corrected each time the model template moves to the next pixel, thereby improving the rate of correct prediction. In this method of coding, a correct prediction will not increase the size of coding. In this respect, it is highly important that the learning table improve itself as it processes data for correct predictions.

Figure 2-402 is a diagram of the coding procedure used.

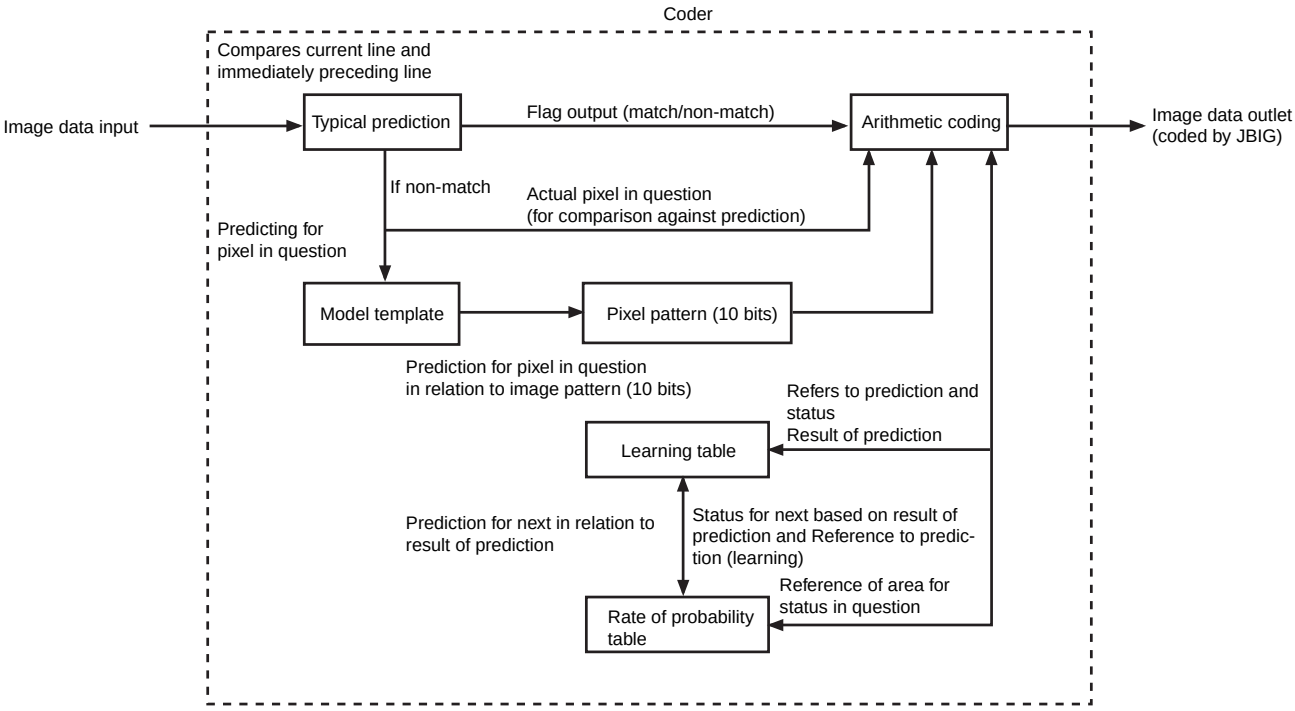
Coder
Compares current line and immediately preceding line
Image data input
Typical prediction
Flag output (match/non-match)
Arithmetic coding
Image data outlet (coded by JBIG)
If non-match
Actual pixel in question (for comparison against prediction)
Predicting for pixel in question
Model template
Pixel pattern (10 bits)
Prediction for pixel in question in relation to image pattern (10 bits)
Refers to prediction and status
Result of prediction
Learning table
Prediction for next in relation to result of prediction
Status for next based on result of prediction and Reference to prediction (learning)
Reference of area for status in question
Rate of probability table

Figure 2-402 Coder and the Flow of JBIG Coding

1. In the typical prediction block, the current line and the immediately preceding line are compared to find out if the latter matches the former. According to the result of this process, a flag (1 bit; 0 for match, 1 for non-match) is attached to the head of each line.
   If a match was identified, the flag (only) is coded by the arithmetic coding block as a pseudo image, without coding the pixels of the line being processed at the time. If a non-match was identified, the pixels of the line being processed at the time are coded by the arithmetic coding block using the model template and the learning table and based on the result of compression between the prediction (white or black) of the pixels in question and the actual levels.

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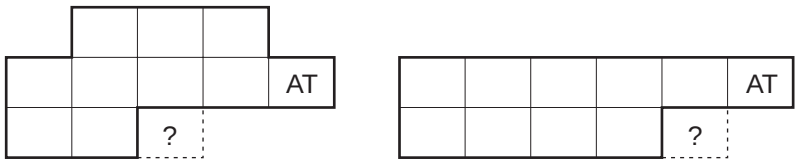
Reference:

If a match is made, the line being processed will be referred to as "being typical." If a non-match is made, on the other hand, the line will be referred to as "not being typical."
When making a prediction for the first line of an image, the background is used as representing the immediately preceding line.

b. Figure 2-403 shows model templates (enclosed by thick lines). Combinations of pixels (pixel pattern; 10 bits) are communicated to the arithmetic coding block.
All 1-bit pixel patterns of the template exist within the learning table, and are used by the arithmetic coding block when referring to prediction levels of pixels in question and status numbers in the learning table according to each pixel pattern.



3-line model template 2-line model template

Figure 2-403 Model Templates

Reference:

The choice between the 3-line model template and the 2-line model template is determined by LRLTWO found within the 2-level image header (BIH).
A pixel represented by "?" is a pixel to be coded, and is outside the template.
A pixel represented by "AT" is a special pixel called an "AT pixel."
An AT pixel makes a template adaptable by changing its position, and will prove to be highly effective when coding an image consisting of cyclic lines (e.g., dither image).
The position of the AT pixel in the diagram is the initial position of any AT pixel. The board, however, will keep the AT pixel at its initial position so that it will not make use of an adaptable type template.

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c. The learning table, as shown below, consists of all 10-bit pixel patterns from the model template and the prediction levels and status numbers corresponding to these image patterns.
The prediction level and the status number of the pixel in question are compared against the actual pixel by the arithmetic coding block each time the model template moves to the next pixel. The result of comparison (whether the prediction is correct or wrong) is checked against the rate of probability table based on the status number, thereby correcting (learning) the prediction level and the status number to be used for the same pattern for the future.
As learning advances, the rate of making correct predictions by the learning table will increase, while the need of coding will decrease.

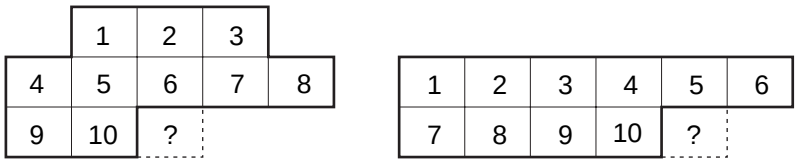

Figure 2-404 Position of a Pixel within a Model Template

Pixel pattern within model template												Prediction level of pixel in question	Status number (ST)
Hexadecimal	Decimal	1	2	3	4	5	6	7	8	9	10		
000h	0	0	0	0	0	0	0	0	0	0	0	0 (white)	0
001h	1	0	0	0	0	0	0	0	0	0	1	0 (white)	0
002h	2	0	0	0	0	0	0	0	0	1	0	0 (white)	0
003h	3	0	0	0	0	0	0	0	0	1	1	0 (white)	0
004h	4	0	0	0	0	0	0	0	1	0	0	0 (white)	0
005h	5	0	0	0	0	0	0	0	1	0	1	0 (white)	0
~													
~													
3FBh	1019	1	1	1	1	1	1	1	0	1	1	0 (white)	0
3FCh	1020	1	1	1	1	1	1	1	1	0	0	0 (white)	0
3FDh	1021	1	1	1	1	1	1	1	1	0	1	0 (white)	0
3FEh	1022	1	1	1	1	1	1	1	1	1	0	0 (white)	0
3FFh	1023	1	1	1	1	1	1	1	1	1	1	0 (white)	0

Table 2-401 Learning Table (initial settings)

ST	LSZ	NLPS	NMPS	SWITCH
0	5A1Dh	1	1	1
1	2586h	14	2	0
2	1114h	16	3	0
3	080Bh	18	4	0
4	03D8h	20	5	0
5	01DAh	23	6	0
6	00E5h	25	7	0
7	006Fh	28	8	0
8	0036h	30	9	0
≈	≈	≈	≈	≈
49	0706h	79	50	0
50	05CDh	48	51	0
51	04DEh	50	52	0
52	040Fh	50	53	0
53	0363h	51	54	0
54	02D4h	52	55	0
55	025Ch	53	56	0
56	01F8h	54	57	0

ST	LSZ	NLPS	NMPS	SWITCH
57	01A4h	55	58	0
58	0160h	56	59	0
59	0125h	57	60	0
60	00F6h	58	61	0
61	00CBh	59	62	0
62	00ABh	61	63	0
63	008Fh	61	32	0
64	5B12h	65	65	1
65	4D04h	80	66	0
≈	≈	≈	≈	≈
106	50E7h	108	107	0
107	4B85h	109	103	0
108	5597h	110	109	0
109	504Fh	111	107	0
110	5A10h	110	111	1
111	5522h	112	109	0
112	59EBh	112	111	1

ST: status number within the learning table.
LSZ: rate of probability (area) at which the prediction is wrong.
NLPS: destination of the next status when the prediction is wrong.
NMPS: destination of the next status when the prediction is correct.
SWITCH: if it is '1' when the prediction is wrong, the next level of prediction is reversed.

Table 2-402 Rate of Probability Table

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Example:

The following explains how the learning table works; in the diagrams, the pixels 1 through 10 of the model template are all assumed to be white:

1. The pixel pattern of the model template will be 000h.
2. The level of prediction against the pixel in question "?" of the pixel pattern 000h is "white"; however, it is actually black, making the prediction "wrong."
3. Since the status ST is "0", a check against the rate of probability table causes the status to move to "1," and at the same time the next prediction will be made "black" by reversing the present prediction.

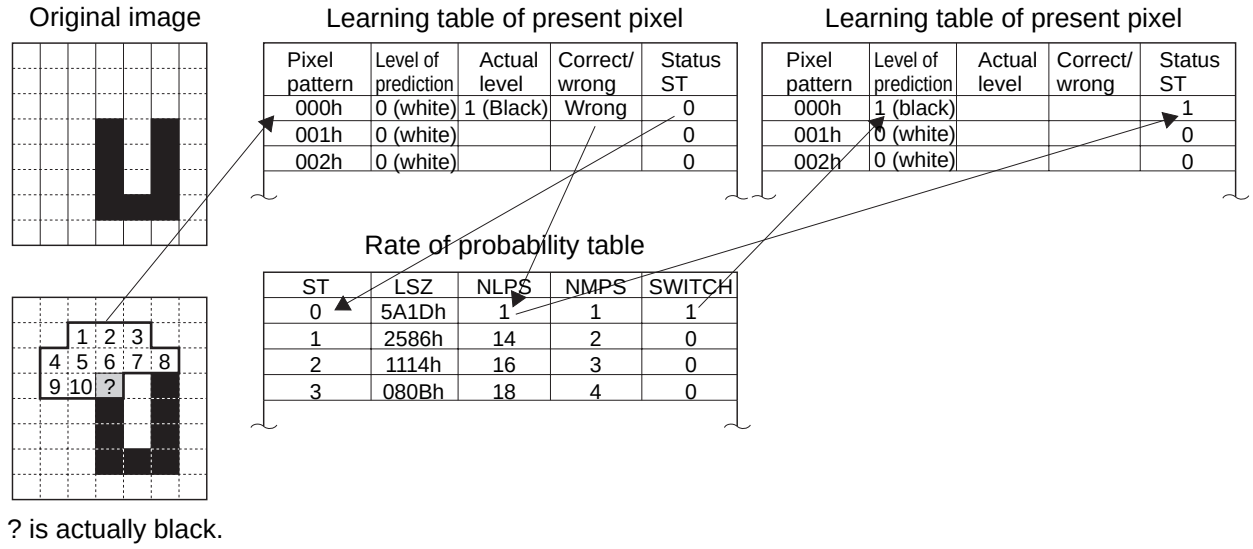

Figure 2-405 Learning Table Operation (example 1)

4. The model template moves to the next pixel. At this time, the pixels 1 through 9 are white and the pixel 10 is black in the model template.
5. The pixel pattern of the model template is 001h.
6. The level of prediction for the pixel in question "?" of the pixel pattern 001h is "white," and the actual pixel is also white. As such, the prediction is "correct."
7. The status ST is "0," and the result of a check against the rate of probability causes the next status to move to "1" while keeping the next level of prediction "white" as it is.

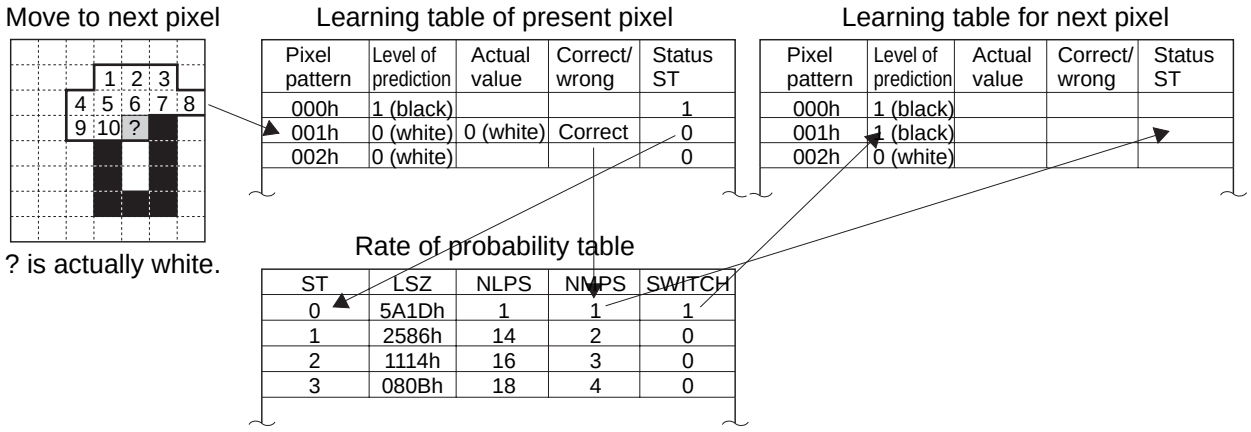

Figure 2-406 Learning Table Operation (example 2)

In this way, the learning table continues to improve on its rate of making correct predictions.

d. The rate of probability is from ITU-T T.83. Unlike the learning table, its contents remain the same.

Reference:

The rate of probability table shown in Table 2-402 expresses the rate of making correct/wrong predictions in terms of an area in reference to each applicable status.
When correct predictions continue, a status number which makes the area smaller will be selected; on the other hand, when wrong predictions continue, a status number which makes the area larger will be selected.

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e. When the level of prediction has been found to be correct or wrong in reference to the actual pixel, model template, and rate of prediction table, the arithmetic coding block codes the result of prediction so that coded image data is generated and transmitted.

f. Unlike the conventional MH or MR coding method, coding (arithmetic) by the arithmetic coding block does not use a conversion table. It rather uses LSZ (area, indicating an estimate of making a wrong prediction), and codes data by expressing the progress of making correct prediction in terms of a numerical line (between 0 and 1.0). Codes expressed on this numerical line, as shown in Figure 2-407, will be under MPS if the prediction is correct and under LPS if the prediction is wrong.

This way of arithmetic coding, further, holds the concept of an "area" (A). This area (A)*2 represents the area (A) of MPS if the prediction is correct for each pixel; it represents the area of LPS if the prediction is wrong.

When this area (A) grows smaller than a specific area*3, the initial bit (except the code '0' indicating the position on a numerical line) is moved to the left as a coded image data unit for output.

At this time, an area (A) smaller than the specific area in question cannot express a position finer than it presently can, requiring enlargement*4 for better expression of a position. This process is called "standardization," and the area (A) is set to a size larger than the specific area in question*3.

The following is a concept of arithmetic coding:

Here the following is assumed:

- The rate of making correct predictions is 50%, and the rate of making wrong predictions is 50%.*1
- The area of correct predictions is MPS, and the area of wrong predictions is LPS.

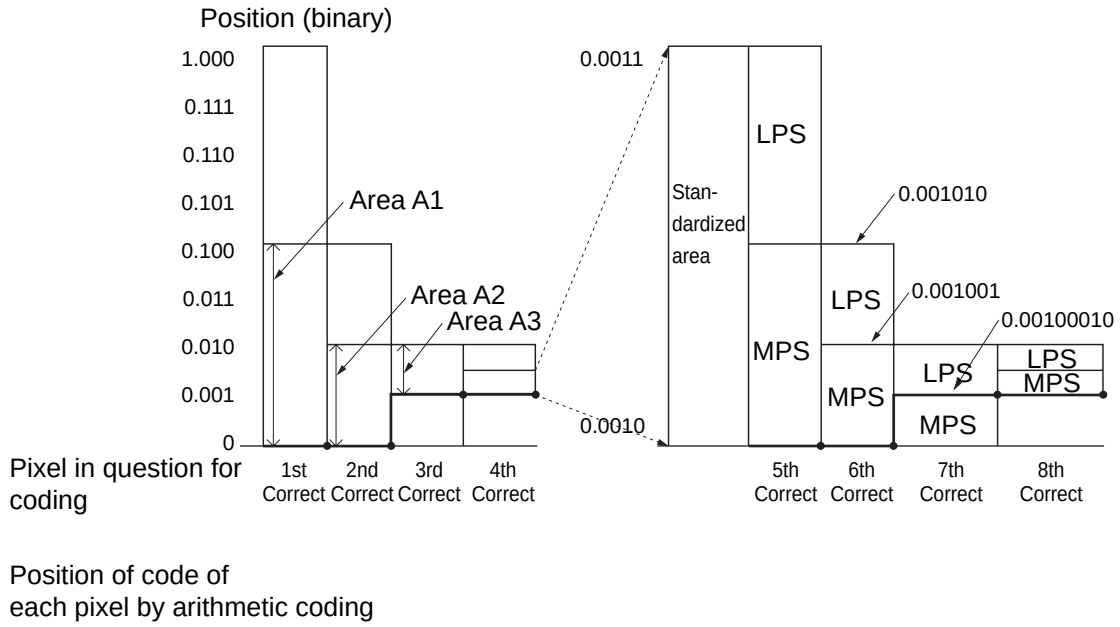

Figure 2-407 Conceptual Diagram of Arithmetic Coding

When the prediction is correct, the present data will have the same position on the numerical line as the previously coded data, characterizing the arithmetic coding method by the absence of the need for an additional bit used to express the position. This fact helps increase the rate of compression if correct predictions continue (i.e., not resulting in an increased volume of coding).

If wrong predictions continue, on the other hand, additional bits will be needed to express the positions of wrong predictions, causing the volume of coding to increase, while at the same time decreasing the rate of compression.

The learning table continues to learn and correct table parameters while coding takes place so as to make correct predictions and increase the rate of compression without increasing the volume of coding.

Reference:

*1 The actual rate of probability varies depending on the applicable status, since it is affected by the share of LSZ in the area A.

*2 The actual area is 8000 to 10000 (hexadecimal).
If the prediction is correct, the area A will be as follows:" A1 = 10000 (hexadecimal) - LSZ, A2 = A1 - LSZ, A3 = A2 - LSZ.
If the prediction is wrong, the area A will be equal to LSZ.

*3 Actually, it is 8000 (hexadecimal).

*4 Actually, the hexadecimal value is shifted to the left and doubled so that it will be 8000 or higher (hexadecimal).

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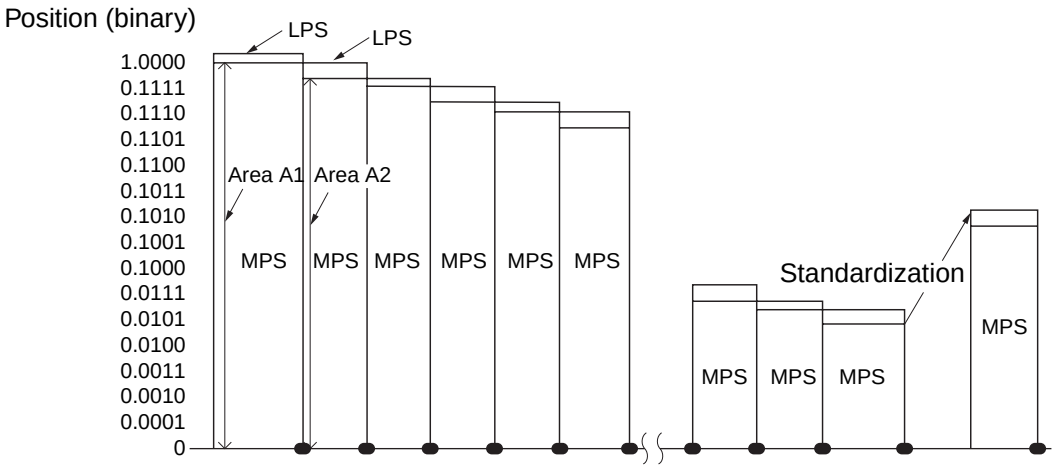
When correct predictions continue, coding will be as follows:

Here, the value of LSZ consisting of correct predictions will be assumed to be 100*[1] (decimal) for all statuses.

The area A will be within 8000 to 10000*[2] (decimal), and uses the initial bit when it falls below 8000*[3] (decimal), generating a coded image data output.

At this time, adjustments are made (by adding 1000*[4], decimal) so that the area A will be 8000*[3] (decimal) or higher. The area of correct predictions will be MPS, and the area of wrong predictions will be LPS.



Number of pixel selected for coding	1 Correct	2 Correct	3 Correct	4 Correct	5 Correct	6 Correct		19 Correct	20 Correct	21 Correct		23 Correct
Position of coding	0	0	0	0	0	0		0	0	0		0
Initial value of area	10000	9900	9800	9700	9600	9500		8200	8100	8000	7900	8900
Standardization											1000	
New initial value											8900	
LSZ	100	100	100	100	100	100		100	100	100	100	100
Area A	9900	9800	9700	9600	9500	9400		8100	8000	7900	8900	8800
Coding output	No	No	No	No	No	No		No	No	Yes		No
Output coding										1bit0		

Figure 2-408 Correct Predictions Continue

In this case, the code of 1 bit is generated when the area A grows to be less than 8000 at the 21st pixel.

This way, the length of a code output will be short, and the rate of compression will be high.

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4. Construction of Image Data by JBIG Image Compression Coding

An image is coded in units of blocks called “stripes” as shown in Figure 2-409.

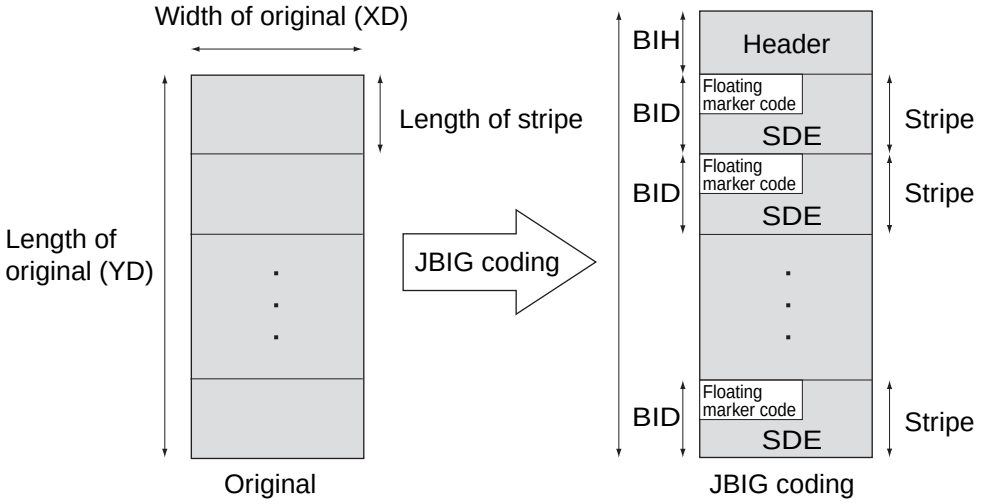

Figure 2-409 Construction of JBIG Image Data

When coding is done, the image data is called “BIE” (Bi-level Image Entity), and consists of a bi-level image header (BIH) and bi-level image data (BID) as shown:

BIE (actual bi-level as it is)			
BIH (bi-level image header)	BID (bi-level image data)	· · · · ·	BID (bi-level image data)

Figure 2-410 Construction of BIE

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5. Bi-Level Image Header (BIH)

BIH may be expressed as the diagrams shown in Figure 2-411, and is used to indicate the size of an image, the number of lines per stripe, and the applicable model template.

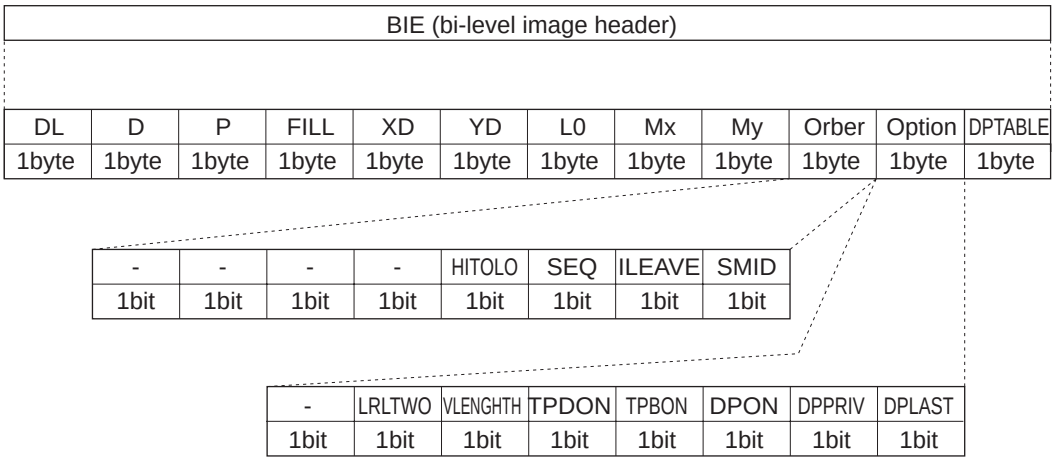
BIE (bi-level image header)
DL D P FILL XD YD L0 Mx My Orber Option DPTABLE
1byte 1byte 1byte 1byte 1byte 1byte 1byte 1byte 1byte 1byte 1byte 1byte
- - - - HITOLO SEQ ILEAVE SMID
1bit 1bit 1bit 1bit 1bit 1bit 1bit 1bit
- LRLTWO VLENGHTH TPDON TPBON DPON DPPRIV DPLAST
1bit 1bit 1bit 1bit 1bit 1bit 1bit 1bit

Figure 2-411 Construction of BIG

6. Notations and Parameters Used in BIH

Notation	Description	Parameter	Remarks
DL	Initial layer for transmission	Fixed to 0x00	
D	Layer representing size of difference	Fixed to 0x00	
P	Number of bit planes	Fixed to 0x01	
FILL	Fill	Fixed to 0x00	
XD	Size of horizontal image on layer D	0xXXXXXXXX	Width of original (number of bits)
YD	Size of vertical image on layer D	0xXXXXXXXX	Length of original (number of lines)
L0	Number of lines per stripe	0xXXXXXXXX	In principle, 128 lines per stripe (0x00000080). If the destination is capable of option mode, stripes with a different number of lines may be used (as changed by bit 79 of DIS). 0 to 127 pixels
Mx	Maximum horizontal offset allowed for AT pixel	0xXX	
My	Maximum horizontal offset allowed for AT pixel	0xXX	
Order	Order of linking stripe data	most significant 4 bits fixed to 0	
Option	Option	most significant 1 bit fixed to 0	
DPTABLE	Private DP table	0 or 1728 bytes	
HITOLO	Order of transmission of layers repesenting size of difference	1 bit fixed to 0	
SEQ	Indication of multiple-layer sequential coding	1 bit fixed to 0	
ILEAVE	Order of transmission of interleaved multiple-bit planes	1 bit fixed to 0	
SMID	Order of transmission of stripes	1 bit fixed to 0	0: 3-line
LRLGTH	Number of standard lines for model template	1 bit 0/1	1: 2-line
VLENGTH	Indication of permission to use NEWLEN marker code	1 bit 0/1	0: NEWLEN not permitted 1: NEWLEN permitted
TPDON	Use of TP for making typical prediction for layer representing amount of difference	1 bit fixed to 0	
TPBON	Use of TP for base layer	1 bit 0/1	
DPON	Use of DP for definitive prediction	1 bit fixed to 0	When DPON is ‘1’, has meaning
DPPRIV	Use of private DP table	1 bit fixed to 0	
DPLAST	Use of last DP table		When DPON is ‘1’, has meaning

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7. Bi-Level Image Data (BID)

BID is constructed as shown in Figure 2-412, and as many RID units exist as there are stripes.

BID consists of a combination of a floating marker code and an image data block which has been processed by JBIG image compression coding called “SDE” (stripe data entity).

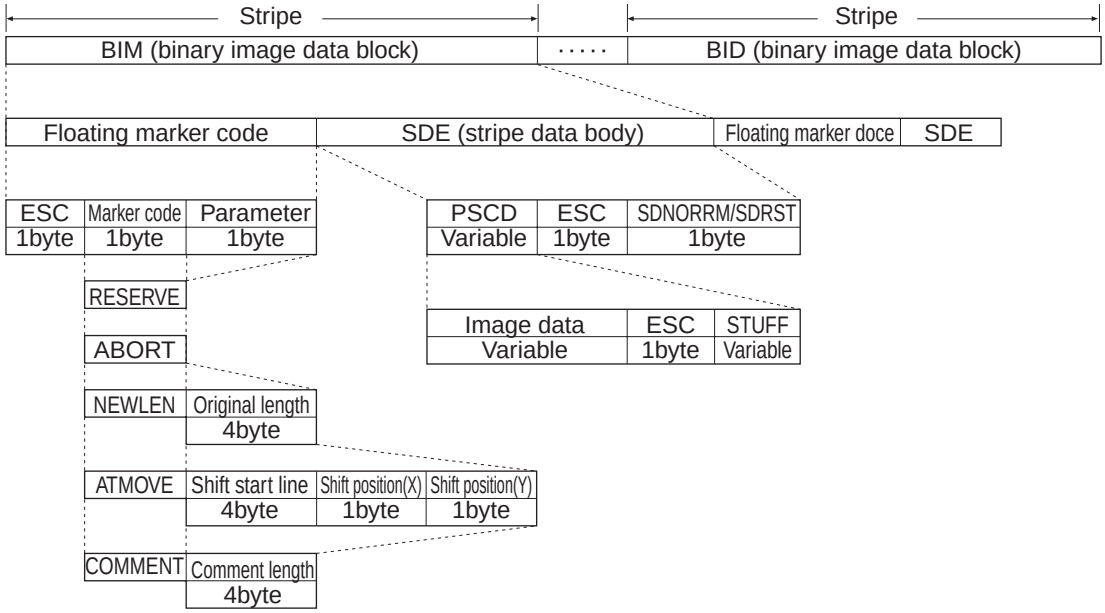

Figure 2-412 Construction of BID

8. Symbols and Parameters Used by BID

a. Floating Marker Code

The floating marker code is set at the head of a stripe data (SDE) unit.

To distinguish the floating marker code from another type of code, ESC (escape code; 0xFF) is always attached at the head.

A floating marker code consists of a marker code and a parameter. The notation “0x” of each marker code indicates that the number that follows is a hexadecimal number.

ABORT (0x05)

Indicates suspension of the code and may appear anywhere in a code.

ESC	0x05

ATMOVE (0x06)
Indicates the line on which the shift of the AT pixel starts and the direction of the shift.

ESC	0x06	Line to start (4 byte)	Destination of shift (X)	Destination of shift (Y)

COMMENT (private comment; 0x07)
Accepts a comment written at will.

ESC	0x06	Length of comment (4 bytes)

NEWLEN (new line; 0x04)
Defines the length of an original once again. Is available only when VLENGTH=ON.

ESC	0x06	Length of original (4 bytes)

RESERVE (0x01)
Is available for special uses only.

ESC	0x01

b. Stripe Data Block

PSCD (protected stripe coding data)
PSCD is the block that remains when the last two bytes (ESC and SDNORM or SDRST) have been removed, and contains image data which has been processed by the JBIG image compression method.

Image Data
Image data is the result of processing by the JBIT image compression coding method.

STUFF
Image data is variable, and is adjusted by transmitting STUFF:0 so as to keep it in units of byte or word (2 bytes).

SDNORM (stripe data end: 0x02)
Indicates the end of stripe data.

ESC	0x02

SDRST (resetting at end of stripe data; 0x03)
Indicates the end of stripe data. ATMOVE and all others will be initialized.

ESC	0x03

Reference:

If the code of image data is 0xFF, 0x00 is always attached at the end of the code of image data 0xFF so as to distinguish it from ESC (0xFF).

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D. V.8/V.34 Procedure

Reductions have been made to the image transmission time using a V.34 standard modem complying with ITU-T (maximum transmission speed of 33600 bps).

1. V.8 Procedure

The V.8 procedure starts a communication as if the type of device (existing modem, fax, V-series modem) is not a factor. (See Figure 2-401.)

- Receiving Modem Not Provided with V.8
  The normal modem connection sequence will be executed.
- Receiving Modem Provided with V.8
  The appropriate modulation method from among the following will be selected and executed. If both transmitting and receiving devices declare V.34, a switch-over is made to V.34. (Execution of V.34 requires execution of the V.8 procedure.)

Possible Modulation Methods

1. V.21
2. V.27ter
3. V29 half duplex, G3FAX, T30, etc.
4. V.17
5. V.32bis or V.32
6. V.34 half duplex, V.34 full duplex

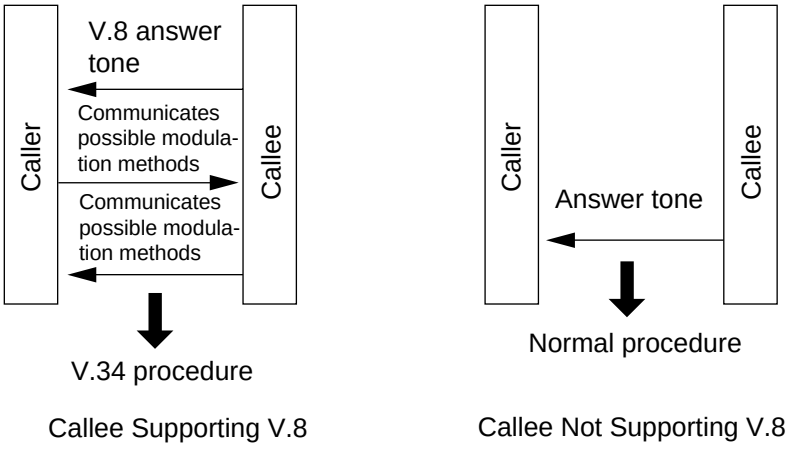

Figure 2-413 V.8 Starting Procedure

2. V.34 Modem

The high-speed modem communication procedure recommended by ITU-T is referred to as "V.34," and may be described as follows:

a. It communicates using half-duplexing mode of a 33.6 kbps modem complying with ITU-T.
b. It automatically selects the most appropriate transmission speed (14 types; every 24000 bps between 2400 bps and 33600 bps).
   transmission speed = data speed (ITU-T recommendation) = data speed
c. It uses ECM.
d. It executes a start-up using the V.8 procedure (V.34, phase 1).
e. A V.34 modem is equipped with a modem circuit of the old recommendation to enable connection with existing modems (upward compatible).
f. In addition to the increased modulation speed, it enables increases in overall speed (not only in segments but also in continuous data transmission) using the following:
   f.1 Pre-Emphasis Technology
   It transmits data by raising the transmission level of the higher-frequency band, which is subject to noise, thereby improving the S/N ratio.
   f.2 Probing Technology
   The transmitting device generates tone signals (probing tones) for use by the receiving device to measure the characteristics of the line, thereby adapting the modem to the existing line conditions.
g. It uses a full duplex mode for the pre-procedure/post-procedure of the V.8 and V.34 protocols, thereby increasing the speed of executing procedures.
h. Its modulation speed (baud rate) may be 2400, 3000, or 3200 symbols/sec (required), or 2743, 2800, or 3429 symbols/sec (optional), allowing more varied choice of a data transmission speed than past modems.
   modulation speed (baud rate) = symbol speed (ITU-T recommendation)

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Memo

1. To select V.17 instead of V.8/V.34, you may operate as follows:
   - Select "No" for ECM (additional functions → custom fax settings → rx settings).
   - Set the transmission speed to 14.4 kbps or lower.
   - Select "No" to ECM (additional functions → custom fax settings → tx settings).
2. A procedure (late start) for switching from V.21 to V.8/V.34.
3. If an error occurs in V.34 communication, redialing will be by V.17.

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Figure 2-402 shows the standard procedure used by V.8/V.34. In V.34, the transmission speed is selected after selecting a modulation speed so as to use the best circuit condition.

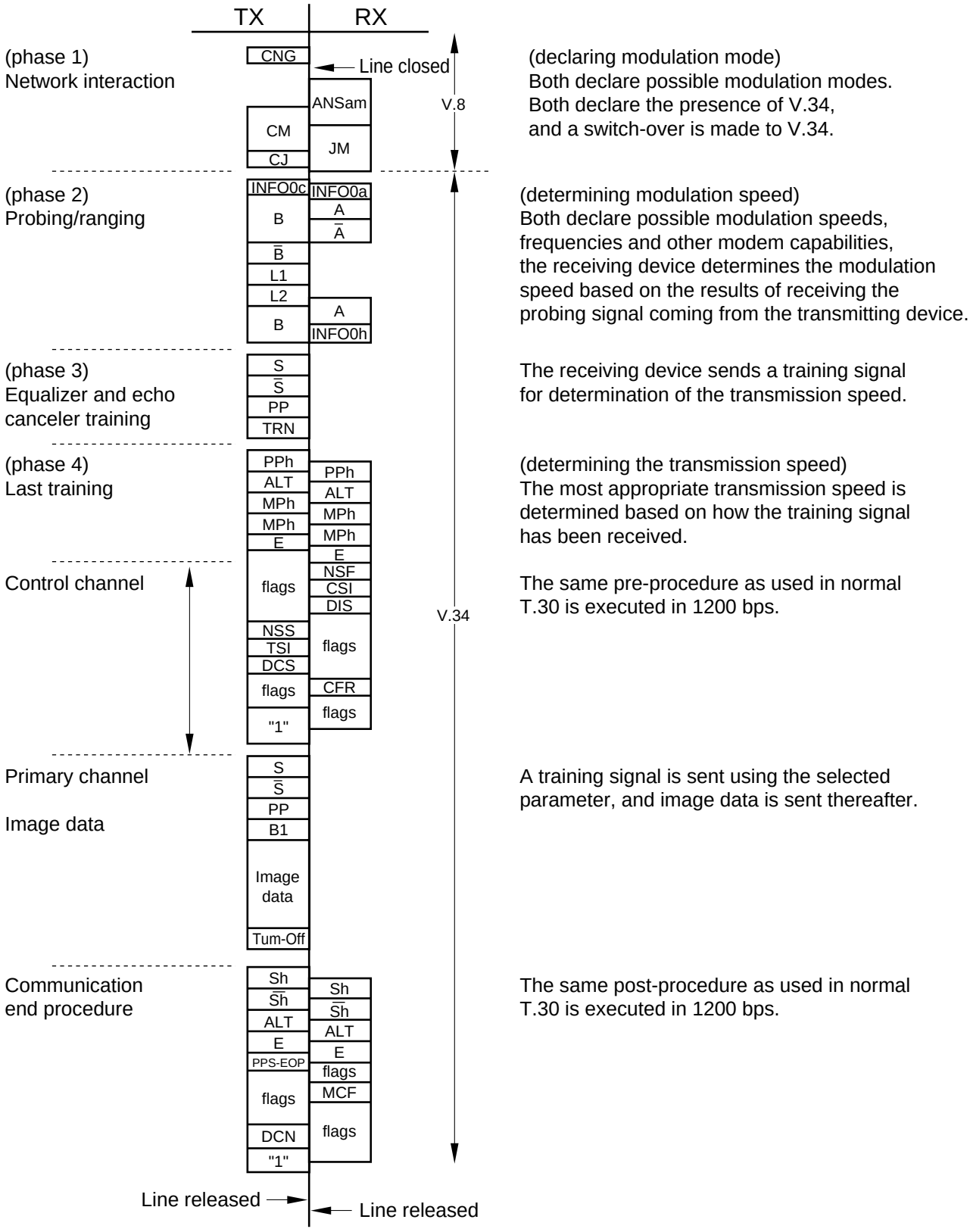

Figure 2-414

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3. Details of the Procedures

a. Network Interruption (phase 1)

V.8 is executed as the start-up procedure for high-speed modem V.34.

In V.8, the most appropriate modulation method (V series modem mode) that is possible between transmitting and receiving devices is determined.

- Transmitting Device

Signal	Notation	Description	Remarks
Start tone	CNG	Is a 1100-Hz tone signal prescribed by T.30 indicating that the device is a fax initiating an automatic ring.	
Start menu signal	CM	Indicates possible modulation methods (V.21, V.27ter, V.29, V17, V.34, etc.).	Modulated by V.21 (L). Modulation speed: 300 bps
CM end terminal	CJ	Indicates detection of a JM signal and the end of a CM signal.	Modulated by V.21 (L). Transmission speed: 300 bps
Start indication signal	CI	Indicates general communication functions. Sent when resuming the V.8 procedure.	For late start, see Figure 2-403. Modulated by V.21 (L). Transmission speed: 300 bps

- Receiving Device

Signal	Notation	Description	Remarks
Common menu signal	AMSam	Communicates the type of terminal (fax) and communicates possible modulation methods in response to the modulation methods communicated by the CM signal form the transmitting device.	Modulated by V.21 (H).
	JM		Transmission speed: 300 bps

V21 (L): Low-range channel defined by V.21; 1080/100 Hz (980 Hz: 1, 1180 Hz: 0).
V21 (H): High-range channel defined by V.21; 1750/100 Hz (1650 Hz: 1, 1850 Hz: 0).

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b. Probing/Ranging (phase 2)

The characteristics of the line are measured, and such modulation-related parameters as modulation speed are set.

- Transmitting Device

Signal	Notation	Description	Remarks
INFO sequence	INFO0c	Communicates modem capabilities such as modulation speed, frequency (high and low ranges used in measuring line characteristics) and requests adjustments.	Transmission speed: 600 bps
Tone B	B	Uses 1200 Hz tone signals. Synchronizes modems.	B is a signal resulting from rotating the phase of B by 180°.
Tone $\overline{B}$	$\overline{B}$		
Line probing signal L1	L1	Is a tone signal used to interpret the line characteristics in probing.	"Probing" refers to measuring of line characteristics. Tone signals in 150-Hz increments between 150 Hz and 3750 Hz.
Line probing signal L2	L2		

- Receiving Device

Signal	Notation	Description	Remarks
INFO sequence	INFO0a	Communicates modulation speeds, transmission frequencies, and other modem capabilities.	Transmission speed: 600 bps
Tone A	A	Uses 2400-Hz tone signal. Synchronizes modems.	A is the result of rotating the phase of A by 180°.
Tone $\overline{A}$	$\overline{A}$		
INFO sequence	INFO0h	Communicates the modulation speed and the pre-emphasis filter used for data transmission based on the results of interpretation made by the line probing signal coming from the transmitting device.	Transmission speed: 600 bps

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c. Equalizer and Echo Canceler Training (phase 3)

Training (adjustment) is executed to optimize the functions of filters (e.g., equalizer) using the parameters set in phase 2.

- Transmitting device

Signal	Notation	Description	Remarks
S signal	S	Executes short training.	S is the result of rotating the phase of S by 180°.
$\overline{S}$ signal	$\overline{S}$		
PP signal	PP	Used for training of an equalizer by the receiving modem.	
TRN signal	TRN	Used to determine the transmission speed by the receiving device.	

d. Last Training (phase 4)

The maximum data transmission speed is selected, a trellis coder is selected, and possible data speeds are selected.

- Transmitting/Receiving Devices

Signal	Notation	Description	Remarks
PPh signal	PPh	Used for training of an equalizer by the receiving modem.	
ALT signal	ALT	———	
Modulation parameter	MPh	Communicates the maximum data transmission speed, type of trellis coding, type of pre-coding, and other parameters used for data transmission.	
E sequence	E	———	20-bit sequence

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e. Control Channel

A T.30 procedure, as used in existing methods, is executed at a transmission speed of 1200 bps.

- Transmitting Device

Signal	Notation	Description	Remarks
Flag	flags	Maintains synchronized state.	7E (H)
Non-standard function settings	NSS	In response to NSF coming from the receiving device, selects a possible mode for reception.	
Communication terminal identification	TSI	Communicates the telephone number of the transmitting device.	
Digital command signal	DCS	Specifies possible modes for communication.	
_____	1	Makes a declaration for switching to a high-speed.	Sends 1s continuously.

- Receiving Device

Signal	Notation	Description	Remarks
Non-standard function	NSF	T functions, user abbreviation, manufacturer code, and others.	
Callee terminal identification	CSI	Communicates the telephone number of the receiving device.	
Digital identification signal	DIS	Communicates ITU-Tstandard functions.	
Flag	flags	Maintains synchronized state.	7E (H)
Reception ready	CFR	Communicates that the modem has been trained and is ready to receive image data.	

Memo:

In control channel exchanges, the transmitting and receiving devices generate signals of different frequencies. As any signals echoed back would be a different frequency, the exchanges would be echo-free.

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f. Primary Channel

Training is executed using the parameters set in phase 4 at a transmission speed of 1200 bps.

- Transmitting Device

Signal	Notation	Description	Remarks
$\overline{S}$ signal	S	Short training	S is the result of rotating the phase of S.
S signal	$\overline{S}$		
PP signal	PP	Is used to train an equalizer by the receiving modem.	
Sequence B1	B1	Is a data frame for scrambling sent at the end of a start-up.	

g. Image Data

Image data is sent.

- Transmitting Device

Signal	Notation	Description	Remarks
Image data	Image data	Is coded image data.	
_____	Turn-off	_____	Sends scrambled 1s for 35 ms.

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h. Communication End Procedure

A single session of communication is ended at a speed of 1200 bps.

- Transmitting Device

Signal	Notation	Description	Remarks
Sh signal	Sh	Executes short training.	
Sh signal	Sh		
ALT signal	ALT	————	
E sequence	E	————	
Transmission end signal	PPS-EOP	Ends transmission of a single page.	
Flag	flags	Maintains synchronized state.	7E (H)
Suspension signal	DCN	Instruct release of the line.	

- Receiving Device

Signal	Notation	Description	Remarks
Sh signal	Sh	Is short training.	
Sh signal	Sh		
ALT signal	ALT	————	
E sequence	E	————	
Flag	flags	Maintains synchronized state.	7E (H)
Message acknowledgment	DCN	Indicates that image data has been received and is ready to receive the next file.	

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4. Protocols

a. Late Start

At times, poor line condition can prevent the start of the V.8 procedure. What is called "late start" is a procedure used to switch to the V.8 procedure after closing the line.

The receiving device switches to the V.8 procedure upon detection of a CM signal while it is generating ANSam signals. If a switch to the V.8 procedure cannot be made (i.e., the transmitting device does not send a CM signal) because of the existing line condition, the receiving device will send a DIS signal including a "V.8 procedure" declaration. In response, the transmitting device will send a CI signal, starting the V.8 procedure.

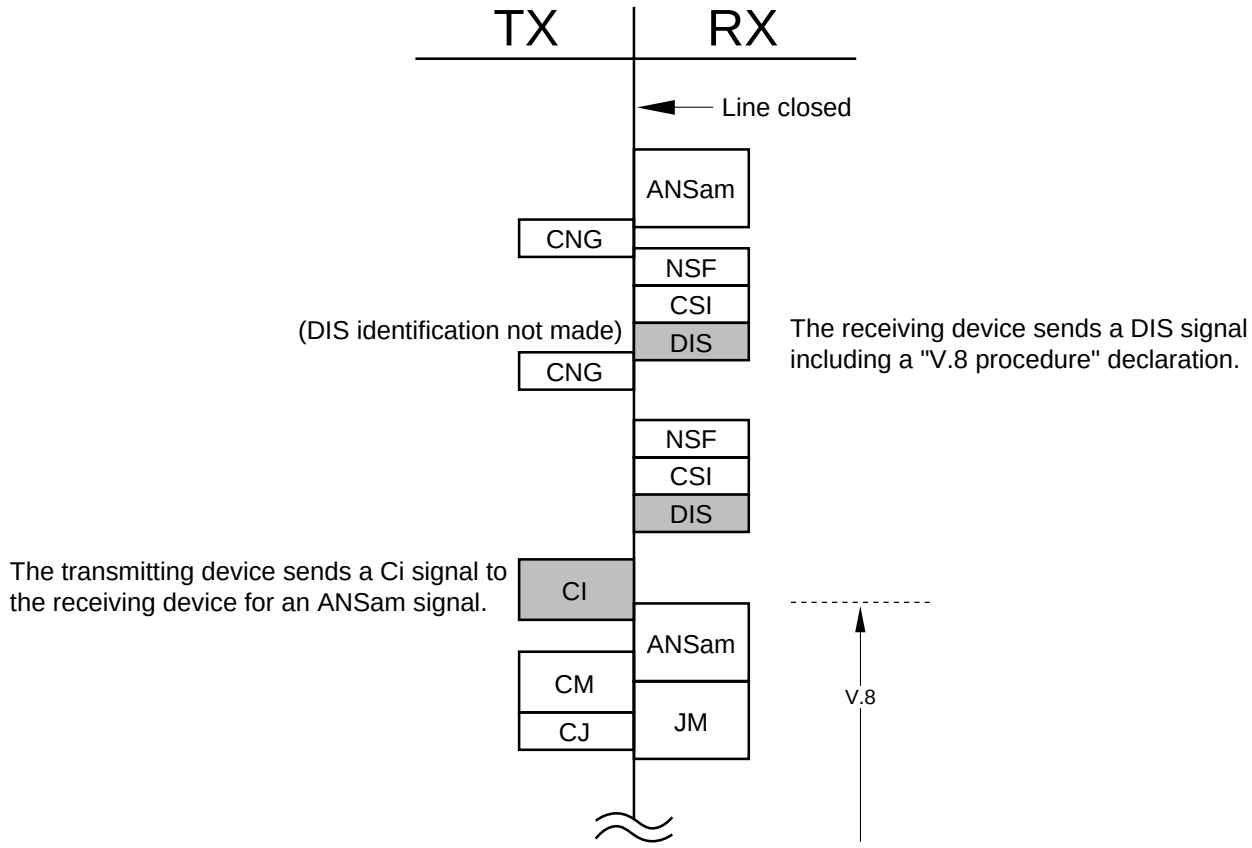

Figure 2-415 Late Start

Note:

The shaded signals need special attention among those in the procedure.

b. Page-to-Page Sequence

A page-to-page sequence is a sequence used between pages, i.e., if a page exists at the end of image data transmission. In the V.34 procedure (for ECM transmission), the page-to-page sequence consists of the following:

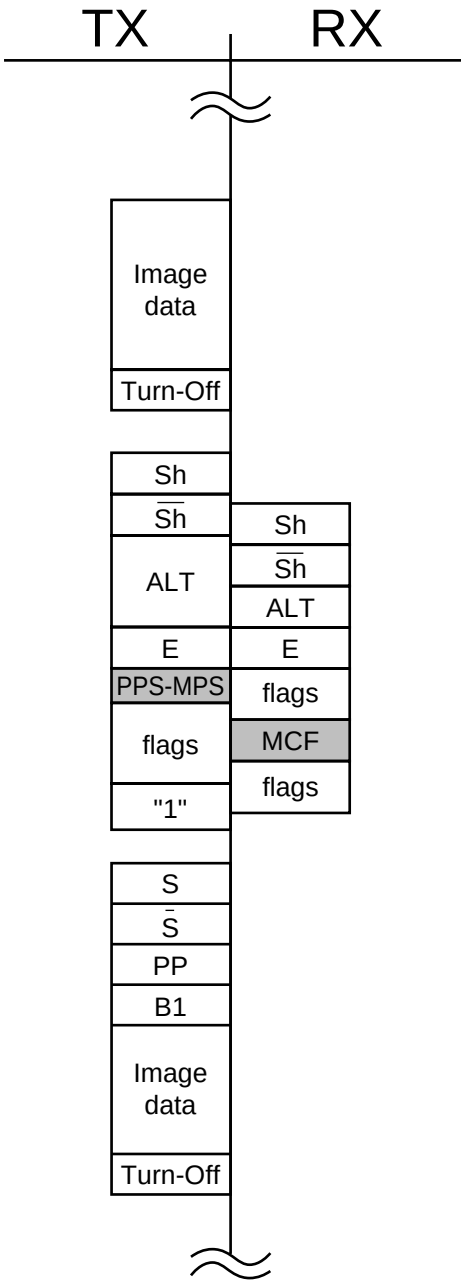

Figure 2-416 Page-to-Page Sequence

Note:

The shaded signals need special attention among those in the procedure.

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c. Mode Change

The transmitting device sends a PPS-EOM signal, while the receiving device sends an MCF signal. Thereafter, the receiving device sends a DIS signal and the transmitting device sends a DCS signal to cause a mode change.

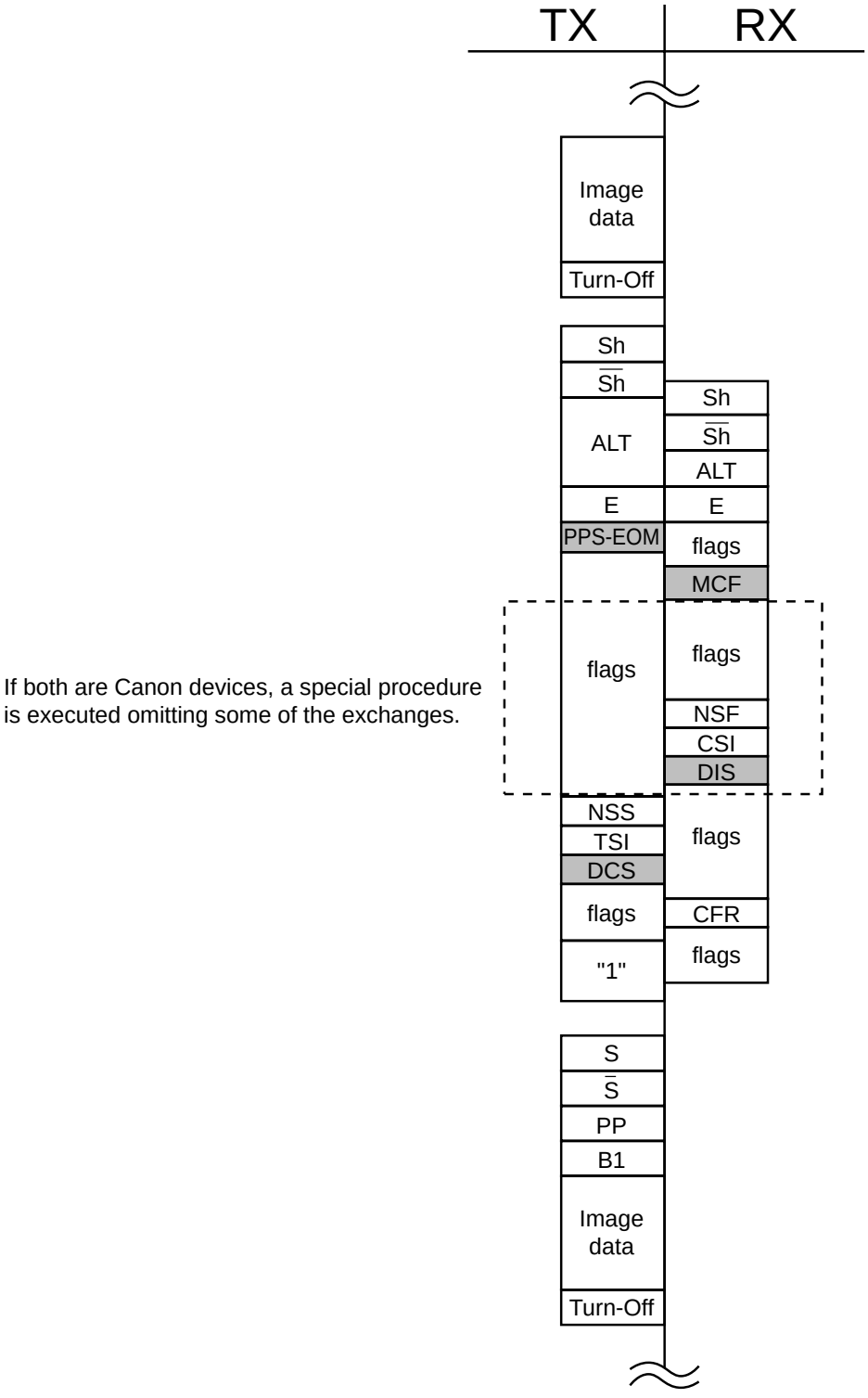

Figure 2-417 Mode Change

Note:

The shaded signals need special attention among those in the procedure.

d. Changing the Data Transmission Speed (by the receiving device)

In response to the Sh signal from the transmitting device, the receiving device sends a PPh signal. Thereafter, the MPh sequence executed by both modems will determine a new data transmission speed.

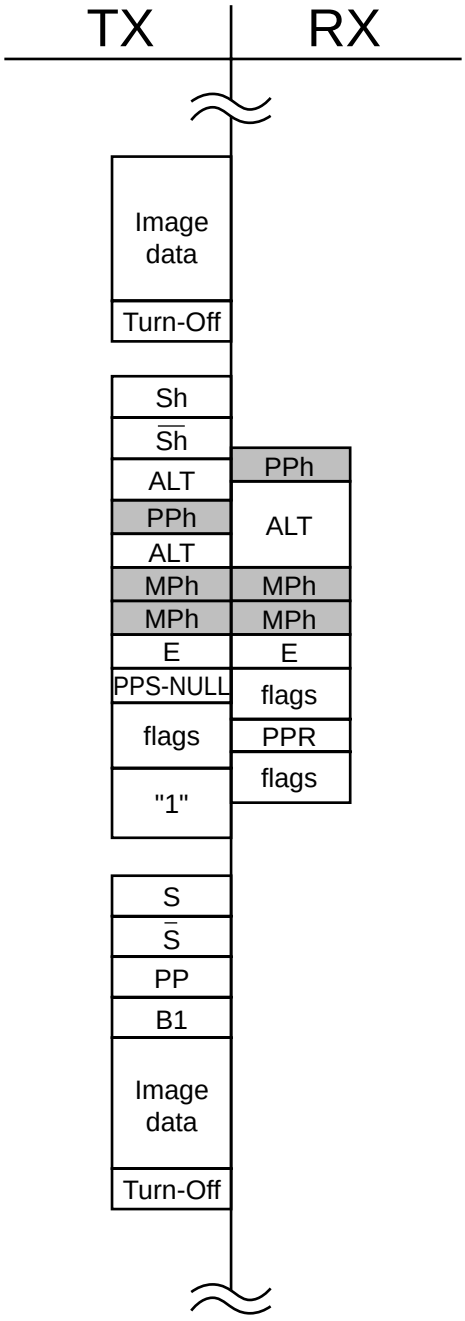

Figure 2-418 Changing the Data Transmission Speed (by receiving device)

Note:

The shaded signals need special attention among those in the procedure.

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e. Changing the Data Transmission Speed (by the transmitting device)

After transmitting image data, the transmitting device sends a PPh signal, and the receiving side also sends back a PPh signal. Thereafter, the MPh sequence is executed by both modems to determine a new data transmission speed.

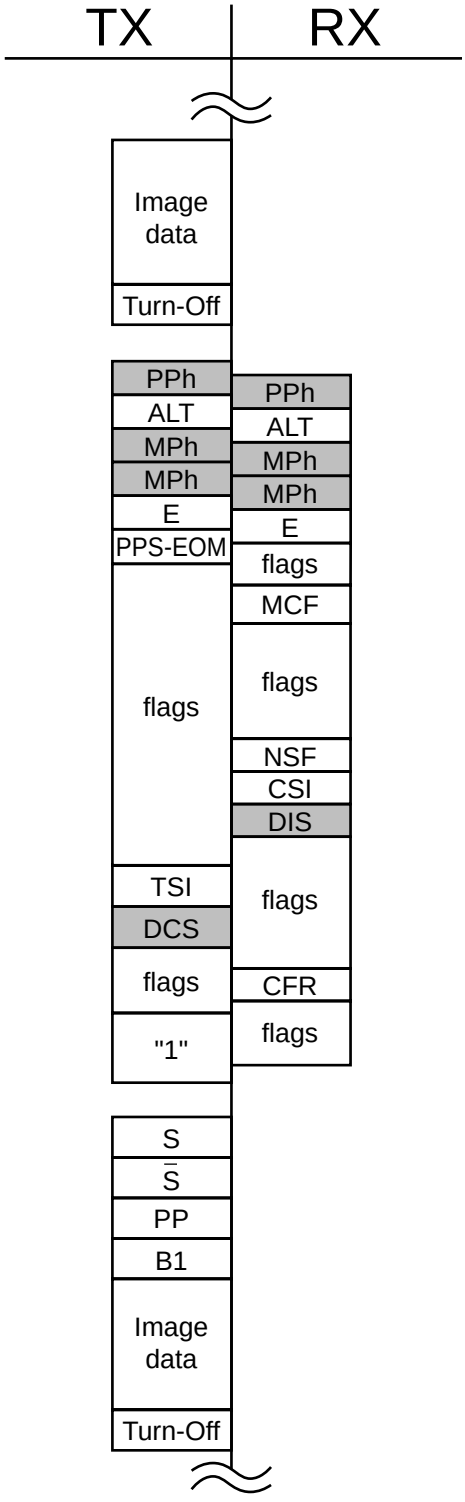


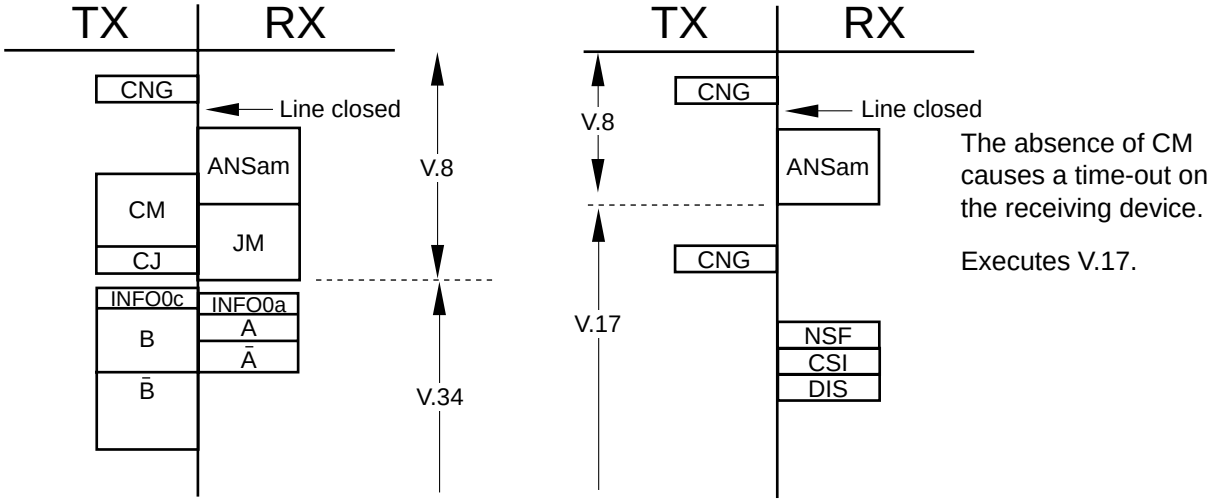
Figure 2-419 Changing the Data Transmission Speed (by transmitting device)

Note:

The shaded signals need special attention among those in the procedure.

f. Switching to the V.17 Procedure (instead of from V.8 to V.34)

If the transmitting device is not provided with a V.34 procedure, the absence of a CM signal in response to an ANSam signal will cause a time-out.



Switching to V.34 V.34 Is Not Available in One Device

Figure 2-420

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E. Rapid Transmission

The FAX Board provides as many as five transmission modes: memory transmission, memory full transmission, direct transmission (synchronized with page reading), rapid transmission, and memory full rapid transmission. Of these, rapid transmission and memory full transmission are executed as follows:

1. Outline

Rapid transmission is a mode of transmission which combines the advantages of direct transmission and memory transmission. When a line connection has been made and the reception capabilities of the receiving device has been confirmed by obtaining a DIS signal, all pages are read and sent.

To start the mode, the transmitting device rings the receiving device. After receiving a DIS signal, it starts to accumulate data (initially, it must be ready for fax communication).

The transmitting device reads pages without reference to transmission. For this reason, rapid transmission requires less total communication time than direct transmission and less time than memory transmission between the start of reading and the end of transmission.

a. Rapid Transmission
   In this mode, reading starts without reference to transmission (non-synchronous) as soon as a DIS signal is received in response to a ring and after a line connection.
b. Rapid Transmission (memory full)
   This mode is initiated as in normal rapid transmission but in the event that the memory becomes full. The pages that have been stored by advance reading will be transmitted, direct transmission mode will be used for the subsequent pages. If the memory becomes full while reading the first page, direct transmission will be used starting with the first page.

2. Conditions for Rapid Transmission

Rapid transmission is used for the following conditions (all conditions must exist at the same time):

a. A single destination is used.
b. "rapid direct tx" is set to "Yes." (See the next page.)
c. Direct transmission is selected.
d. The stamping function is turned off.
e. No specific time has been specified.

Note:

If the stamping function is turned on, direct transmission will be used and a SENT stamp will be put on the pages.

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3. Sequence (reading/transmission)

Each mode uses its own reading and transmission sequence as shown in Figure 2-409.

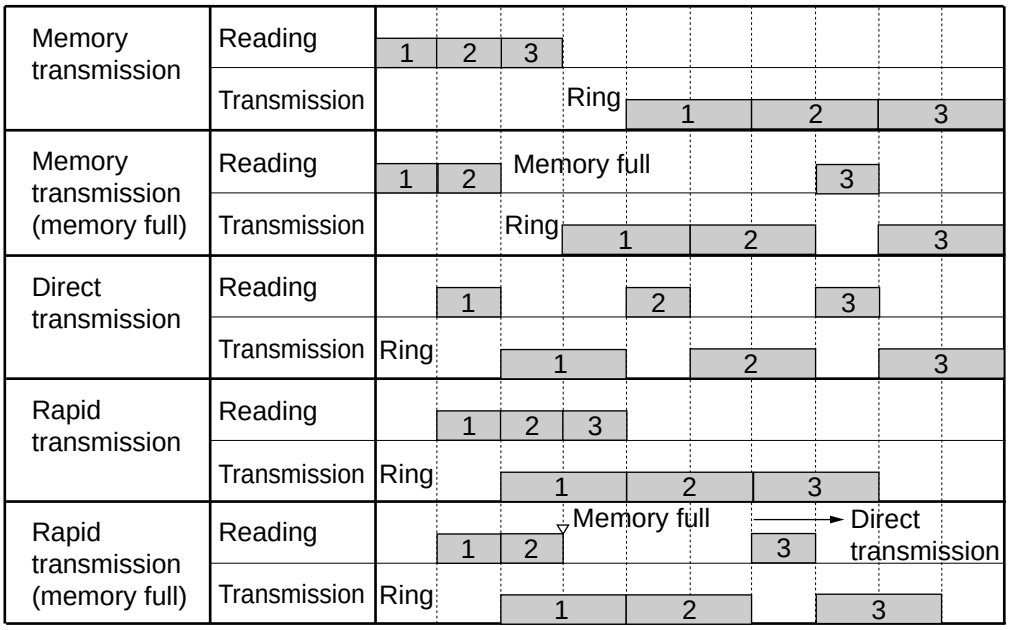

Figure 2-421 Reading/Transmission Sequence

4. Settings

Settings for rapid transmission are made using "fax specifications settings" in user mode.

additional functions > custom fax settings > tx settings >rapid direct tx

ON: selects rapid transmission.
OFF: selects normal direct transmission.

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F. Direct Transmission

Description		Single	
Ring time		None	
Suspension	Press on Stop key	Before pre-selected operation	Returns to standby
		After pre-selected operation	Returns to standby
	Original pulled out	Before pre-selected operation	If an original exists at the end of a pre-selected operation, a message will appear to that effect on the LCD; thereafter, the mode returns to default and then to standby after a time-out.
		After pre-selected operation	Returns to standby immediately.

1. end of pre-selected operation
   Refers to a state that occurs when an original has been set after a transmission mode or a destination has been selected.
2. destination
   Refers to a press on the one-touch or speed dial or a press on the Start key after a press on the keypad.
3. after pre-selected operation
   Refers to the state that occurs between the end of a pre-selected operation and the end of the transmission task initiated by the operation or to a redial wait period.
4. Direct transmission is given priority over memory transmission.
5. In the following cases, memory transmission reservation mode will be selected over direct transmission.

a. Multiple destinations are specified.
b. A specific time is specified using the Timer key.

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G. Memory Transmission Reservation

Number of destination		1 description		
Call timing		Priority (high)		Time selected for timer transmission.
		(middle)		Time stored in the one-touch dial/speed dial function.
		(low)		Immediate.
Interruption	Memory full	Call timing	Specified	Generates an error sound, indicates a message on the LCD, and returns to stanby.
			Not specified	Shifts to memory over-flow (direct) transmission.
	Press on Stop key	Before storage		Returns to standby.

H. Broadcasting

Destination		216 destinations (one-touch dial + speed dial + keypad dial)	
Call timing		Priority (high)	Timing stored in the group function.
		(middle)	Time stored in the one-touch dial/speed dial function.
		(low)	Immediate.
Inter-ruption	Memory full	Generates an error sound, indicates "Memory Full" on the LCD, and returns to standby.	

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I. Timer Transmission/Timer Broadcasting

Destination		Broadcasting	216 (one-touch dial + speed dial + keypad)
		Normal	1
Specified ring time		By operator (24-hour format)	
Suspension	Memory full	Generates an error sound, and indicates a message to that effect, and returns to standby.	
	Press on Stop key	Before start of storage	Returns to standby
Changing time/address		Before start of communication	Possible
		After start of communication	Possible

Note:

- These functions operate always in relation to memory transmission reservation mode.

J. Polling Reception/Multiple Polling Reception

Destination	Multiple	216 (one-touch dial + speed dial + keypad)
	Normal	1
Time of ring	As specified (24-hour format)	

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K. Timer Polling Reception/Timer Multiple Polling Reception

Destination	Multiple	216 (one-touch dial + speed dial + keypad)
	Normal	1
Time of ring	As specified (24-hour format)	
Change of time	Before start of communication	Not possible
	After start of communication	Not possible
Timer polling	As specified (24-hour format)	

Note:

- Timer polling reception/timer multiple polling reception are functions enabled by setting the timer polling function in user data.
- Polling reception is initiated at a specified time every day.

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L. Paper Size Declaration in Reception Mode

The relationship between paper size (as declared) and cassette size is as follows:

If "Yes" is selected for "memory reception" in "fax specifications settings," the cassette size will be used as the paper size for declaration regardless of the presence/absence of recording paper. However, if the cassettes are all A4 or smaller, A4 will be used for declaration.

If "No" is selected for "memory reception," the cassette with recording paper will be used for declaration.

a. declaration by DIS: See the table.
b. declaration by NSF/NSC: Yes

ADDITIONAL FUNCTIONS > CUSTOM FAX SETTINGS > RX SETTINGS > REMOTE RX, MEMORY RX

Cassette	Possible paper sizes
A4	A4
LTR	A4
LGR	A4
B4	B4
A3	A3
11x17	A3
A5	None
B5	B4
STMT	None

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V. ARRANGEMENT AND FUNCTIONS OF ELECTRICAL PARTS

A. Fax PCBs

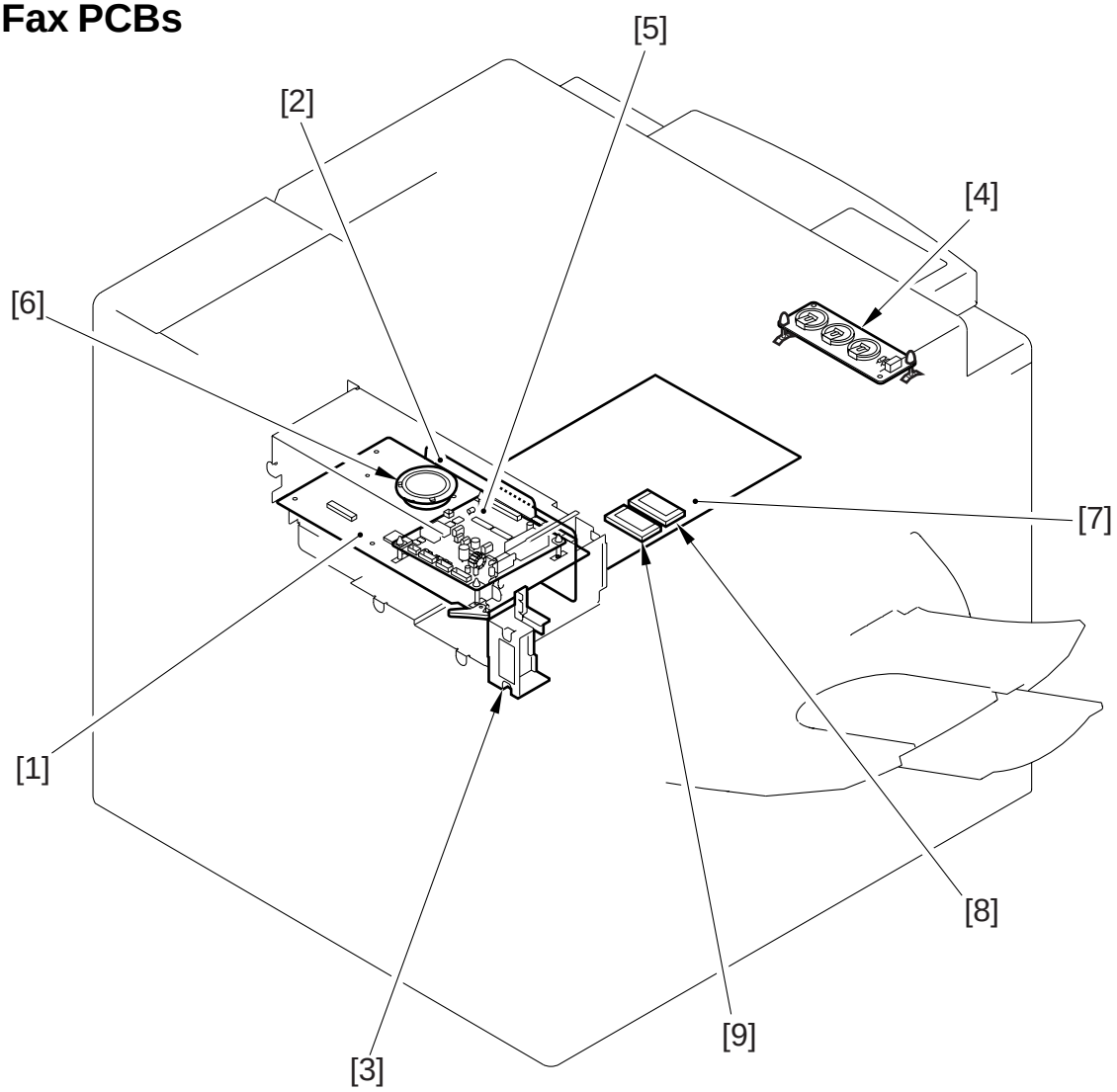

Figure 2-501

Ref.	Name	Description
1	FAX PCB	Controls fax functions.
2	System motherboard	Connects buses.
3	Modular PCB	Provides a modular jack.
4	Battery PCB	Backs up images during power shortages.
5	NCU	Controls network functions.
6	Speaker	Generates acknowledgment/warning sounds.
7	Image processor PCB (copier)	Performs image processing, binary processing, smoothing, and coding/decoding.
8	Expansion memory (accessory)	Serves as extra memory (image memory, page memory).
9	Expansion memory (accessory)	Serves as extra memory (image memory, page memory).

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B. Variable Resistors (VR), Light-Emitting Diodes (LED), and Check Pins by PCB

Of the VRs and LEDs, and check pins used on the FAX Board, those needed for servicing in the field are discussed.

Caution:

1. Some of the LEDs hold current and emit dim light. This is a normal condition, and must be kept in mind.
2. VRs that may be used in the field:

VRs that must not be used in the field:

Caution:

Do not touch any of the VRs or check pins not discussed herein. They are for factory use only, and require special tools and instruments for high accuracy.

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1. FAX Board

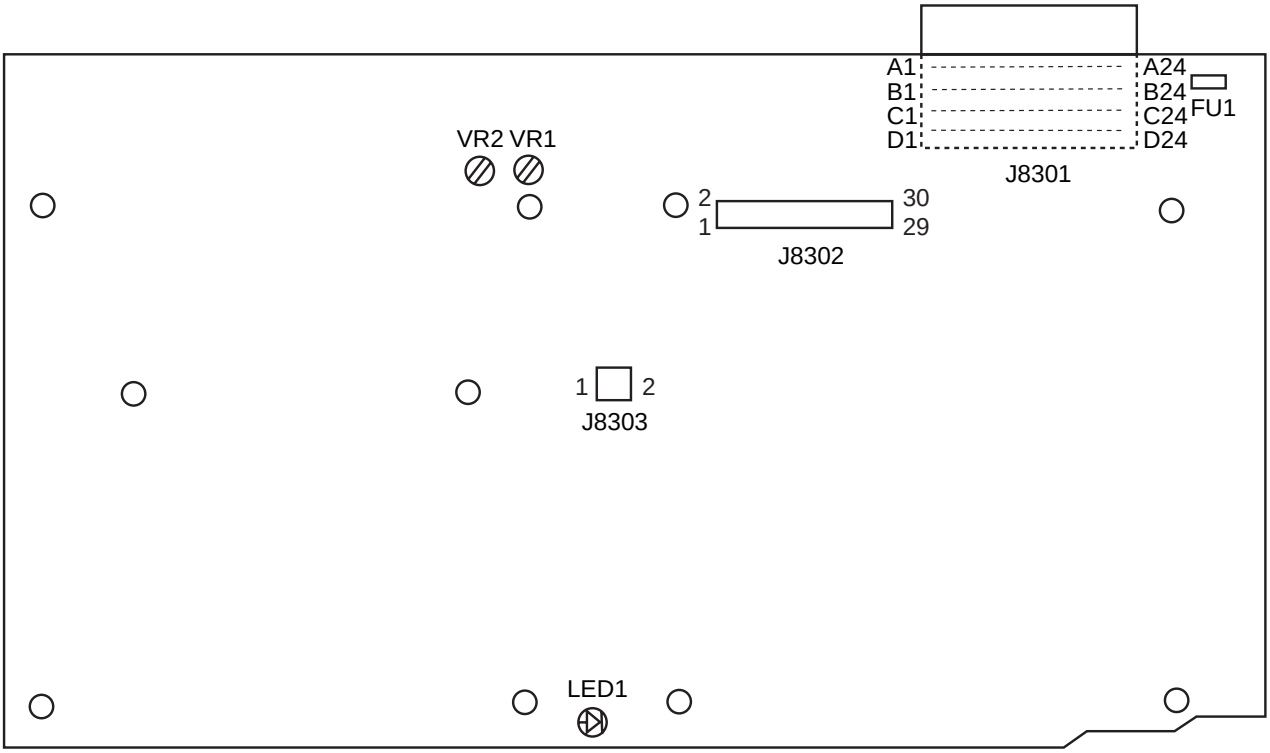

Figure 2-502

Notation	Description
J2	Serves as connector for speaker
J3	Serves as connector for NCU interface
J4	Serves for page memory (3 M; standard). Expansion will enable the use of Ultra Fine mode.
J5	Serves for image memory (3 MB, 9 MB). After expansion, space for transmission/ reception will increase.
J100	Serves as interface connector to FAX Motherboard.
LED1	Remains on as long as boards are normally supplied with 5 V.
SW2	Used when expanding memory. Turn it off before starting the work; then, turn it on after the network.
BAT1	Serves as vanadium battery. It keeps memory backed up for 24 hours.

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2. NCU PCB

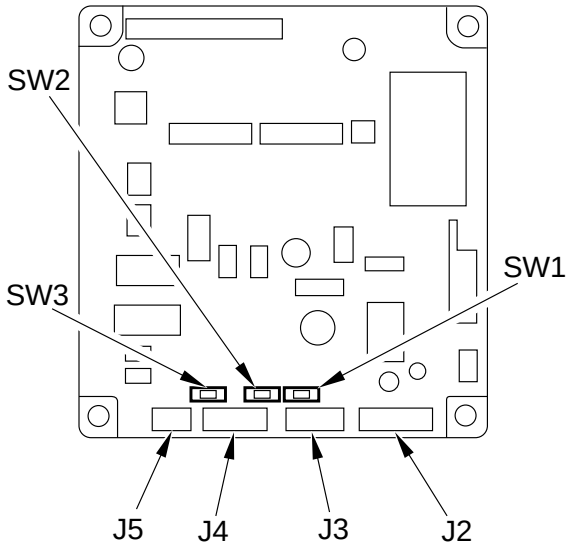

Figure 2-503

Notation	Function
J1	Serves as interface connector to Fax PCB
J2	Serves as circuit cable connector
J3	reserved
J4	Serves as circuit cable connector
J5	reserved

	SW1	SW2	SW2
EC (GENERAL)	A	A	A
SWEDEN	A	B	B
UK/AUSTRALIA/ OCEANIA	B	A	A
FRANCE	-	-	-

Figure 2-504

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CHAPTER 3

MECHANICAL SYSTEM

I. PREPARATIONS/POINTS TO NOTE 3-1
A. Turning Off the Main Power Switch 3-1
II. DISASSEMBLY/ASSEMBLY 3-2
A. Fax Board 3-2
B. NCU PCB 3-7
C. Battery Board 3-8
D. Installing the Expansion Board Base Unit 3-11

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I. PREPARATIONS/POINTS TO NOTE

A. Turning Off the Main Power Switch

Before starting disassembly/assembly work, be sure to turn off the main power switch of the copier in which the board is installed, and disconnect the power plug.

In addition, keep the following in mind:

1. When the main power switch is turned off, the backup secondary battery used to retain the fax memory images starts to operate. Be sure to finish the work within one hour if it requires turning off the main power switch.
2. Check the Communications Memory lamp on the control panel to find out whether there is a fax memory image. If it is on, indicating the presence of an image, print out the image before turning off the main power switch and disconnecting the power plug.
3. Some units remain powered even when the copier's control panel power switch is turned off. Be sure to turn off the main power switch.
4. Exercise care. Opening the front door will not turn off the power when both the control panel power switch and the main power switch are on.
5. If the Communications Memory lamp is flashing while the handset (accessory) is being used, check to find make sure that the LINE modular jack is securely fitted in place.

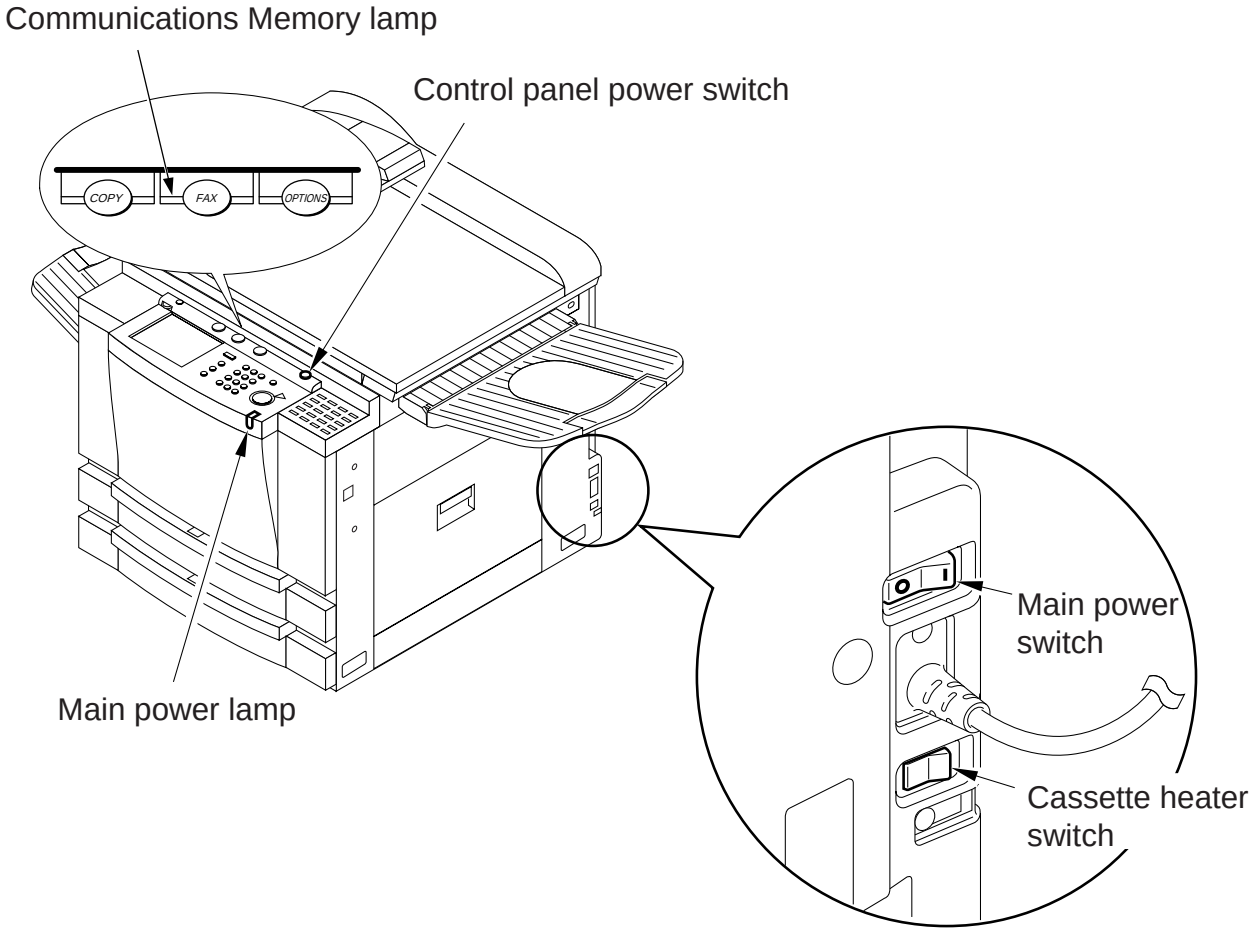

Figure 3-101

II. DISASSEMBLY/ASSEMBLY

A. Fax Board

1. Removing the Fax Board

Caution:

1. When disconnecting the connectors from the fax PCB or the NCU PCB, take extra care not to damage the PCBs.
2. When pulling out the fax PCB from the extension kit, check to make sure that the connectors have fully been disconnected from the PCB.

1) Turn off the main power. (See I. "Preparations.")
2) If the machine has been equipped with a printer extension function, detach the PDL face cover and the rear cover (4 screws).

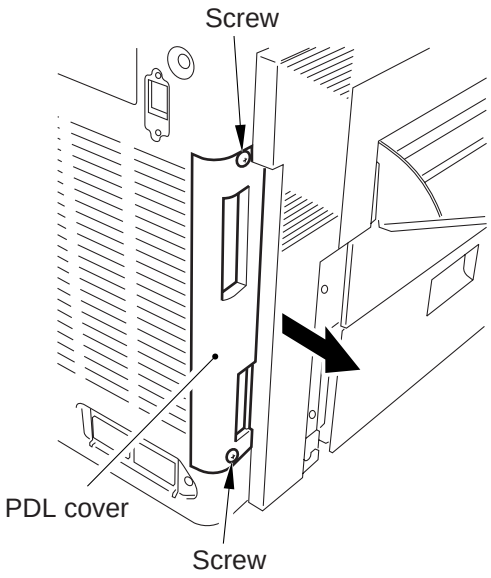

Figure 3-201

3) Detach the extension case cover (5 screws).

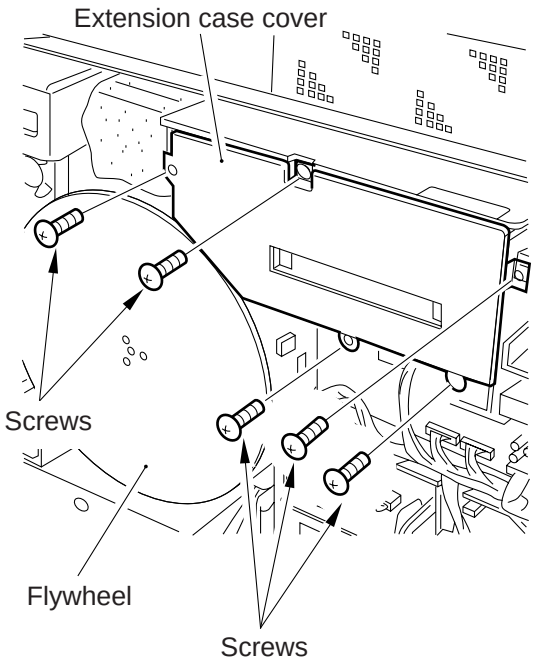

Figure 3-202

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4) Remove the screw, and disconnect the right end of the ARG cable.

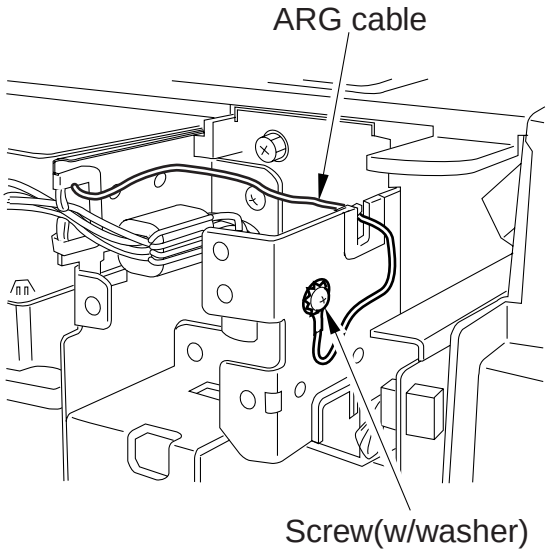

Figure 3-203

5) Free the ARG cable from the edge saddle shown in the figure.

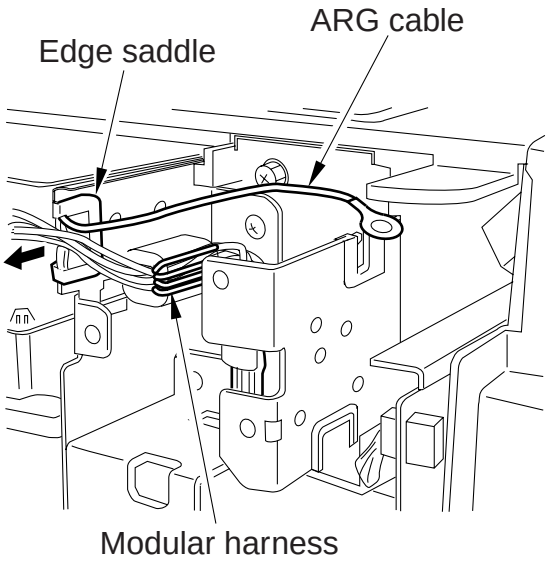

Figure 3-204

6) Pull out the fax PCB halfway from the extension kit; then, disconnect the two modular harnesses from the NCU PCB.

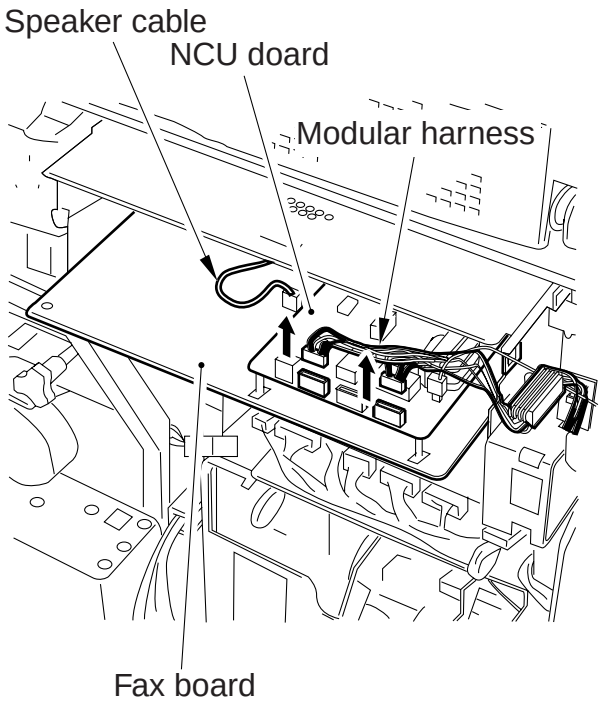

Figure 3-205

7) Disconnect the ARG cable shown in the figure.

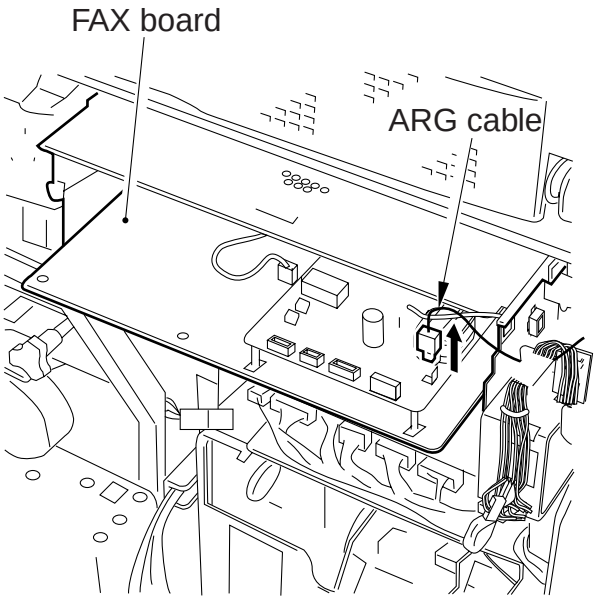

Figure 3-206

8) Disconnect the speaker connector from the fax PCB.

9) Check to make sure that no connector is connected to the fax PCB or the NCU PCB; then, pull out the fax PCB from the extension kit with care.

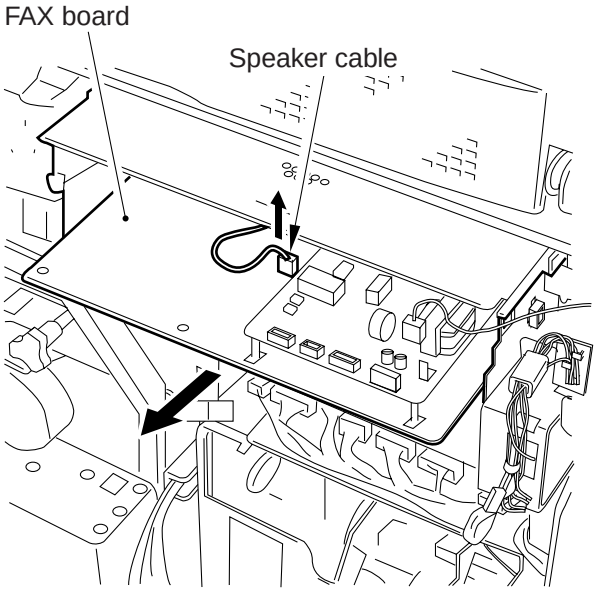

Figure 3-207

2. Installing the Fax Board

Caution:
When fitting the modular harness or the ARG cable to the fax board, be sure to support the connector from below so as not to deform the PCB.

1) Insert the fax board halfway into the topmost slot of the expansion unit.
2) Mount the speaker cable to the fax PCB.

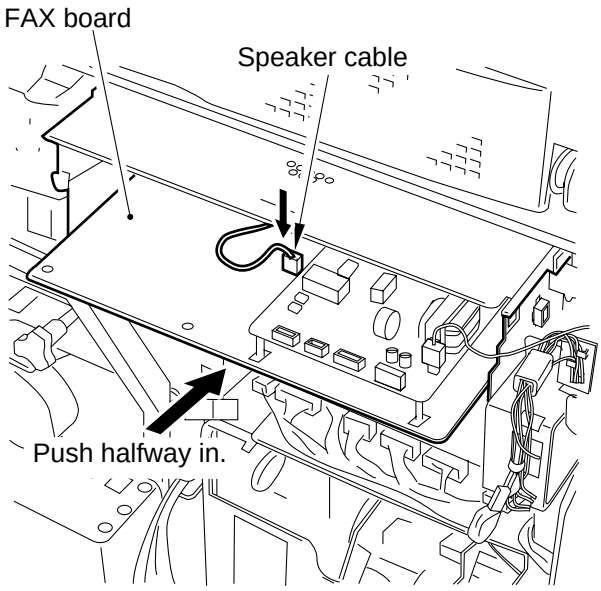

Figure 3-208

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3) While supporting the back of J2 on the NCU PCB, mount the ARG cable. (Be sure no to apply excess force to the PCB.)

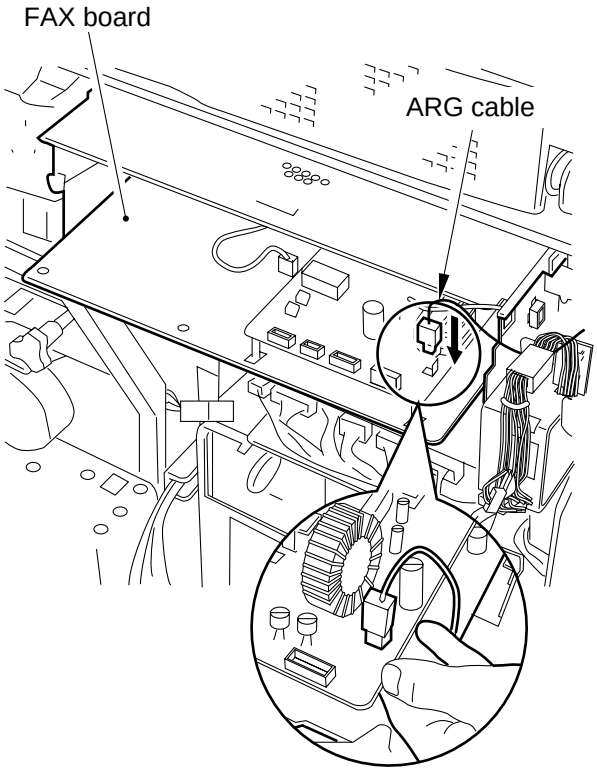

Figure 3-209

4) Put the speaker cable into the wire holder.
5) Connect the connector of the modular harness to the NCU PCB.
When connecting the connector, be sure to support the back of the PCB so as to avoid deforming the PCB.

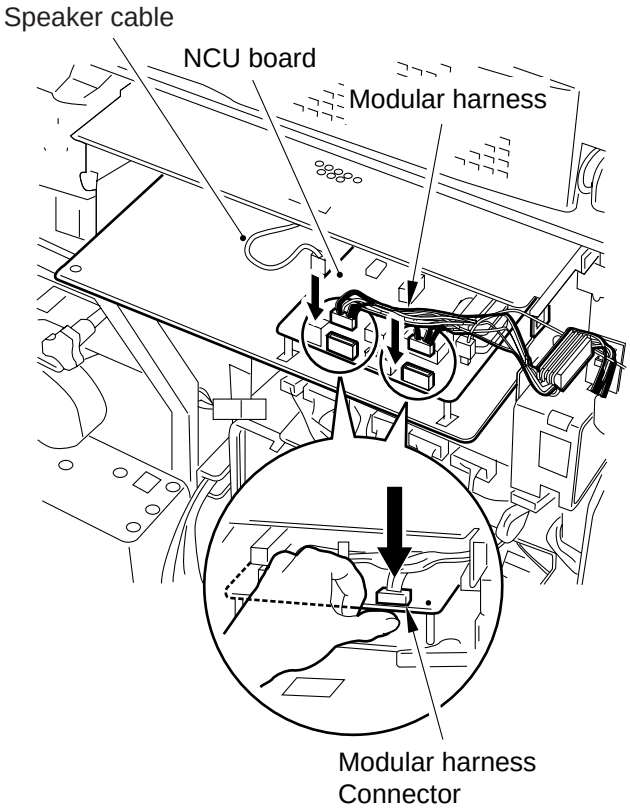

Figure 3-210

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6) Insert the fax board halfway in, and check to make sure that there is no gap around the connector.

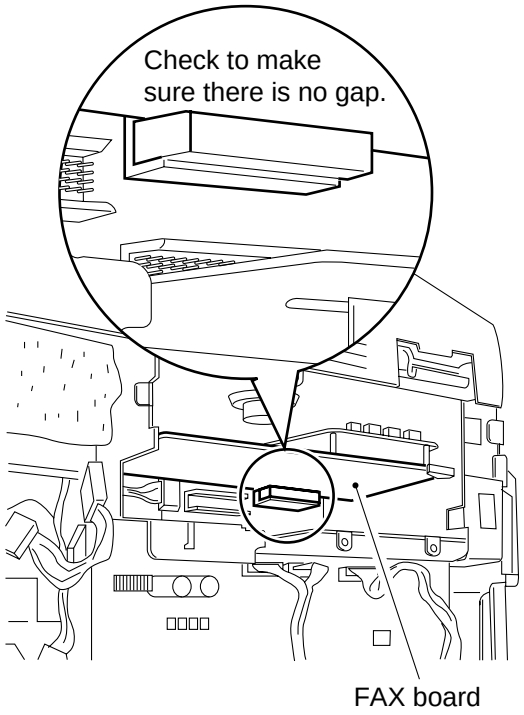

Figure 3-211

7) Fit the ARG cable and the modular harness into the edge saddle of the expansion unit.

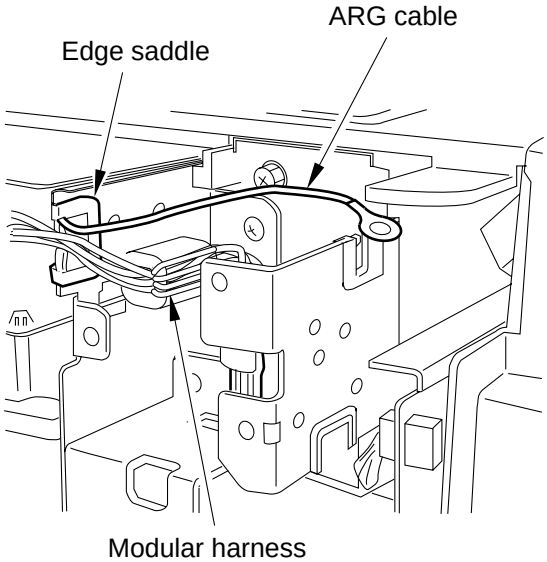

Figure 3-212

8) Secure the tip of the ARG cable in place as shown with the screw that comes with the board.

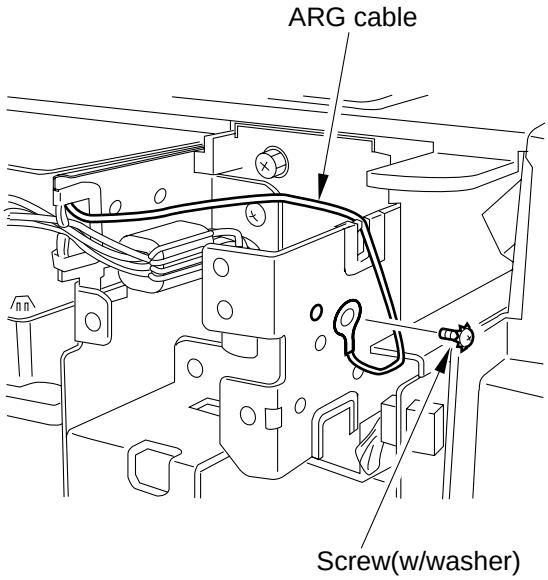

Figure 3-213

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B. NCU PCB

1. Removing the NCU PCB

1) Detach the fax board from the extension case unit.
2) Release the claws of the flat cable shown in the figure.
3) Release the head of the locking support found between the NCU PCB and the fax PCB, and detach the NCU PCB.

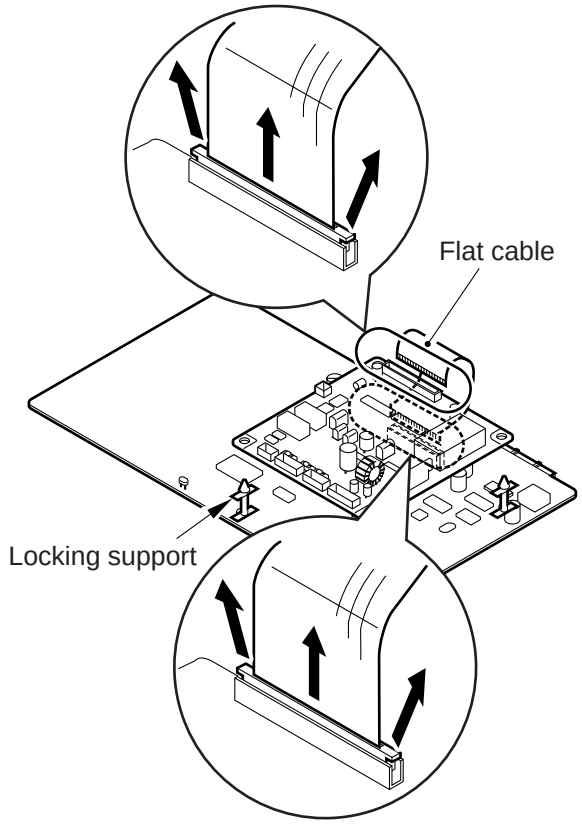

Figure 3-214

2. Mounting the NCU PCB

1) Connect the flat cable.
2) Mount the fax PCB and the NCU PCB using the locking support. At this time, check to make sure that the protrusion on the locking support is mounted as indicated in the figure.

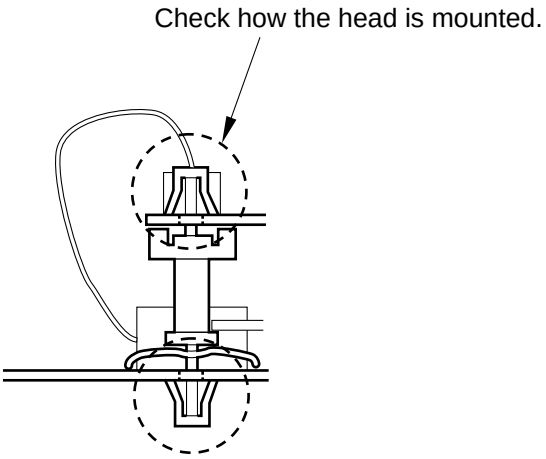

Figure 3-215

<Switch Setting of the NCU PCB>

· NCU Switch Settings

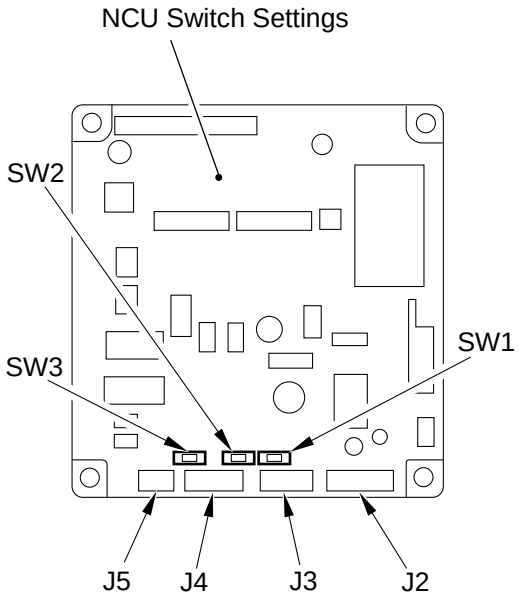

Figure 3-216

· NCU Switch Settings

	SW1	SW2	SW2
EC (GENERAL)	A	A	A
SWEDEN	A	B	B
UK/AUSTRALIA/	B	A	A
OCEANIA			
FRANCE	-	-	-

Figure 3-217

C. Battery Board

Caution:

When mounting or removing the battery board, take care not to touch the BD unit.

1. Removing the Battery Board

1) Check to make sure that the Communications Memory lamp is off. Then, turn of the main power.
2) Remove the copyboard glass retainer (right), and detach the copyboard glass.

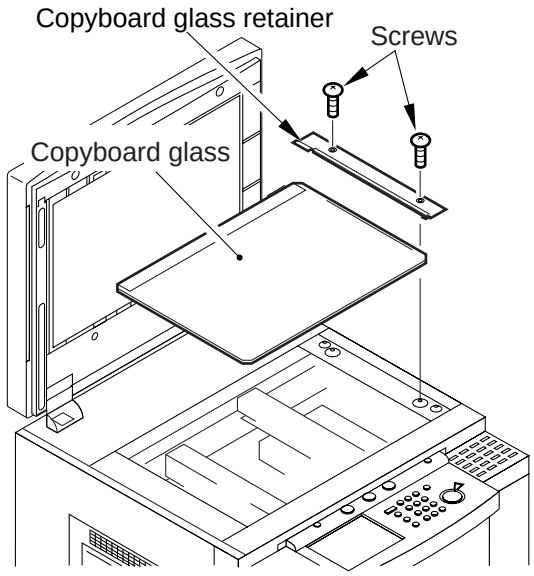

Figure 3-218

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3) Remove the small cover from the IP cover.

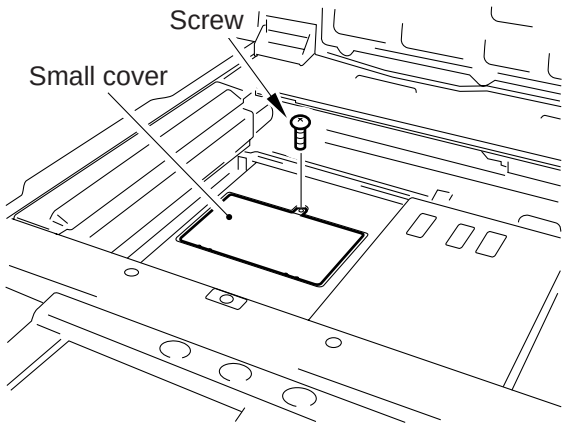

Figure 3-219

4) Slide SW702 to '2' (OFF).

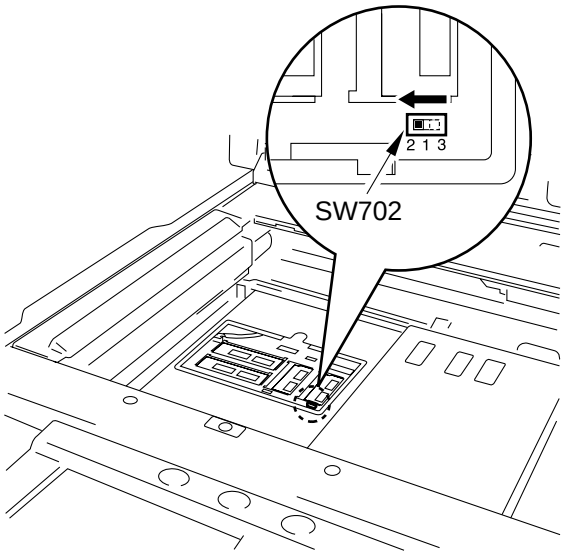

Figure 3-220

5) Free the harness guide of the scanner from the hooks.

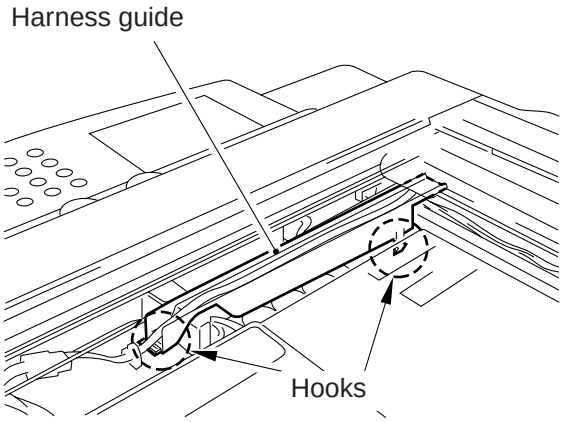

Figure 3-221

6) Disconnect the connector shown in the figure.
7) Push the protrusion of the locking support shown in the figure, and detach the board as if to pull it off the locking support.

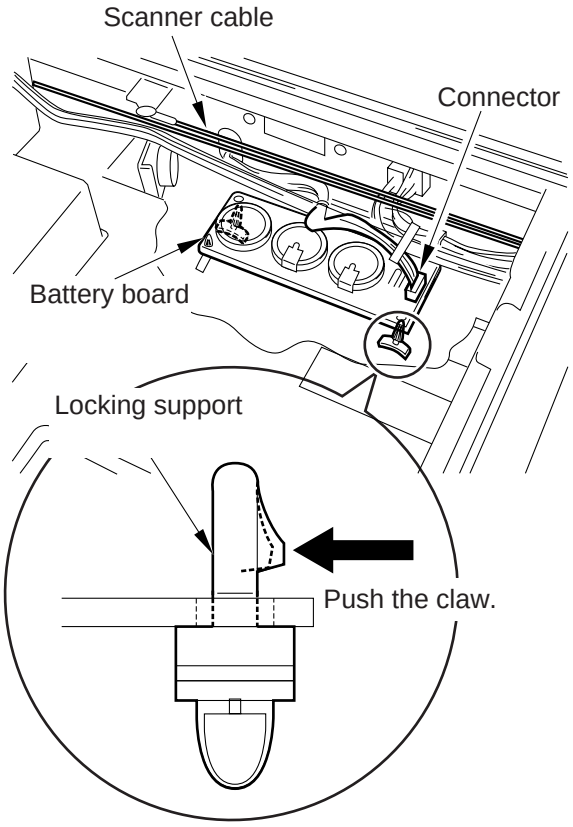

Figure 3-222

2. Mounting the Battery Board

1) Mount the battery board to the locking support, taking care not to place it on the IP cover or any metal plate.
2) Then, slide SW702 to '3' (ON).

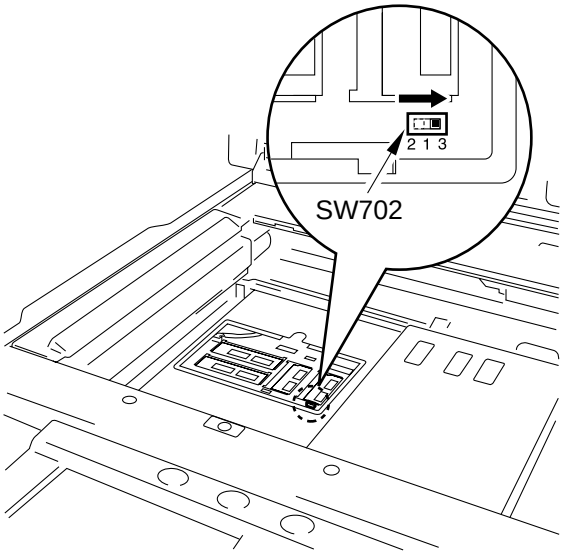

Figure 3-223

3) Mount the harness guide, small cover, and copyboard glass retainer (right).

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D. Installing the Expansion Board Base Unit

1) Remove the four screws, and detach the rear cover.
2) As shown in the Installation Procedure for the expansion board base unit, install the expansion board unit to the copier. (However, do not mount the expansion case cover at this point.)
   - Install the expansion base unit to the copier with three screws.
   - Connect the two connectors.

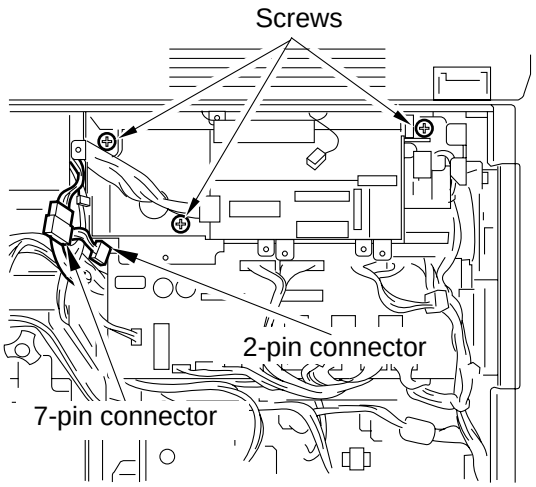

Figure 3-224

3) Put the two connected connectors through the gap on the left of the expansion base unit, and make sure that the connector harnesses will not interfere with the flywheel.

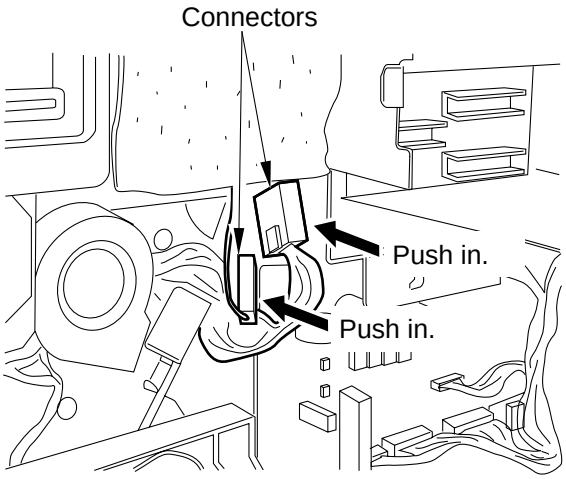

Figure 3-225

4) Mount the speaker, speaker holder, and wire holder.

CHAPTER 4

SERVICE MODE

I. SERVICE MODE 4-1
A. Service Data 4-1
B. Service Mode 4-2
C. Test Mode (#10 TEST) 4-36
II. SERVICE REPORT 4-49
A. System Dump List 4-49
B. Error Transmission Report 4-51
C. Error Reception Results Report (for servicing) 4-52
D. Default Setting List 4-53

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I. SERVICE MODE

A. Service Data

1. Outline

Service data consists of the following nine items (#1 through #9). In addition, test mode (#10 TEST) may be used.

SSSW: service soft switch

Use it to register/set basic fax functions (e.g., error control, echo prevention, communication problem prevention).

#2 MENU: menu switch settings

Use it to register/set functions needed at time of installation (e.g., NL equalizer, output level).

#3 NUMERIC Param: numeric parameter settings

Use it to enter numeric parameters.

#4 NCU: (subject to limitation)

Use it to set various items as a group to reflect #5 TYPE settings.

#5 TYPE: site settings

Use it to set the type so that the service data will be set to comply with the communication standards of the country of installation.

#6 GENESIS (subject to limitation)

Do not change the original settings, or the reading image quality may be lost.

#7 PRINTER: printer functions settings

Use it to register/set basic printer functions (for servicing work; e.g., conditions for reducing received images).

#8 CLEAR: data initialization mode settings

Use it to initialize each data item to its default setting.

#9 ROM: ROM control

Is disabled. (The settings may be checked under DISPLAY in copier service mode *1*).

Use it to execute various tests. (For details, see I.B "Test Mode.")

#10 TEST

Use it to execute various tests. (For details, see I.B "Test Mode.")

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B. Service Mode

1. Starting Service Mode and Making Selections

1) Press the asterisk key ' ✳ ' on the control panel.
2) Press '2' and '8' on the keypad at the same time.
3) Press the asterisk key ' ✳ ' on the control panel.
   - The display changes to the screen shown in Figure 14-804, indicating the connected accessories (FEEDER, SORTER, FAX)

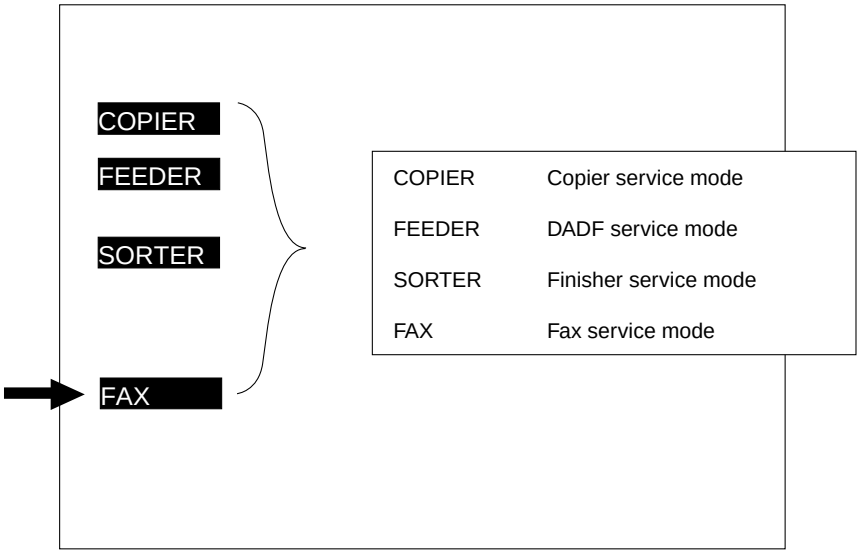

Figure 4-101

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b. Keys

The #1 SSSW screen is used as an example. The functions of the keys and operations are common to all screens.

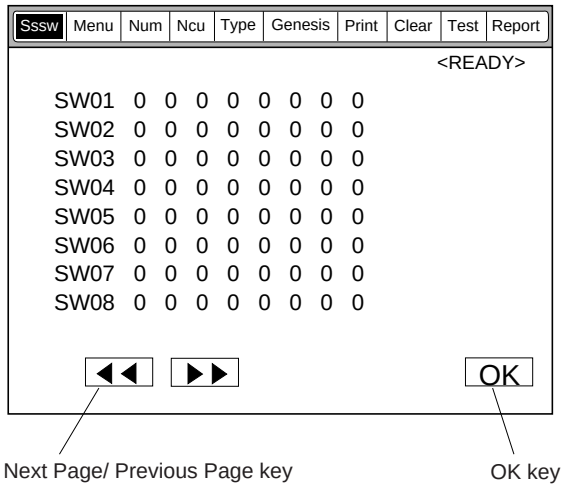
Sssw
Menu
Num
Ncu
Type
Genesis
Print
Clear
Test
Report
<READY>
SW01 0 0 0 0 0 0 0 0
SW02 0 0 0 0 0 0 0 0
SW03 0 0 0 0 0 0 0 0
SW04 0 0 0 0 0 0 0 0
SW05 0 0 0 0 0 0 0 0
SW06 0 0 0 0 0 0 0 0
SW07 0 0 0 0 0 0 0 0
SW08 0 0 0 0 0 0 0 0
OK
Next Page/ Previous Page key
OK key

Figure 4-102

- For the bit switch, to change '0' to '1' (or '1' to '0'), press the appropriate bit (number) directly.
- To change a value or to execute an item, press the OK key.
- To enter a value, use the keypad.
- To move back by a level, press the Reset key.

3. Service Mode Menu List

#1 SSSW	SW01	error/copy control
	SW02	setting prohibited
	SW03	echo prevention settings
	SW04	communication problem prevention settings
	SW05	standard function <DIS signal>settings
	SW06	reading conditions settings
	SW07	closed connection function setting
	SW08	closed connection ID settings
	SW09	display settings
	SW10	remote control
	SW11	operation settings
	SW12	page timer settings
	SW13	setting prohibited
	⏐	⏐
		setting prohibited (SW13 to SW24)
	SW24	pin code function setting
	SW25	report display function settings
	SW26	transmission function setting
	SW27	setting prohibited
	SW28	V.8/V.34 procedure setting
	SW29	setting prohibited
	SW30	setting prohibited

#2 MENU	NL EQ	NL equalizer
	MONITOR	telephone line monitor
	ATT(P)	transmission level (ATT)
	V34 BAUD	V.34 modulation speed upper limit
	V34 SPEED	V.34 data speed upper limit
	PCI FREQUENCY	pseudo CI signal frequency
	DATE	date display

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#3 NUMERIC param.	001	reserved
	002	RTN signal transmission condition (1)
	003	RTN signal transmission condition (2)
	004	RTN signal transmission condition (3)
	005	NCC pause length (before ID code)
	006	NCC pause length (after ID code)
	007	reserved
	008	reserved
	009	comparison of digits (caller and callee telephone numbers)
	010	line connection identification time
	011	reserved
	012	reserved
	013	reserved
	014	reserved
	015	reserved
	016	reserved
	017	reserved
	018	reserved
	019	reserved
	020	reserved
	021	reserved
	022	reserved
	023	reserved
	024	reserved
	025	reserved
	026	reserved
	027	reserved
	028	reserved
	029	reserved
	030	reserved

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- #7 PRINTER
  - SSSW
    - SW01 reserved
    - SW02 reserved
    - SW03 reserved
    - SW04 reserved
    - SW05 reduction/cassette selection setting
    - SW06 reduction setting
    - SW07 reserved
    - SW08 reserved
    - SW09 reserved
    - SW10 reserved
    - SW11 recording control setting
    - SW12 reserved
    - reserved (SW12 through SW20)
    - SW20 reserved
  - NUMERIC Param.
    - 01 longer image reception printing missing image area
    - 02 reserved
    - 03 reserved
    - 04 leaning edge margin
    - 05 trailing edge margin
    - 06 reserved
    - reserved (06 through 30)
    - 30 reserved

- #8 CLEAR
  - TEL
  - USSW SW
  - SERVICE SW
  - NCU
  - SERVICE DATA
  - REPORT
  - ALL
  - COUNTER

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4. Registering Bit Switch (#1 SSSW)

Each registration/settings item of the bit switch consists of eight bits. They indicate the following, each bit either 0 or 1.

	Bit 7							Bit 0
AW01	0	0	0	0	0	0	0	0

Caution:

Some service data items must not be changed. If so instructed, do not change any default settings.

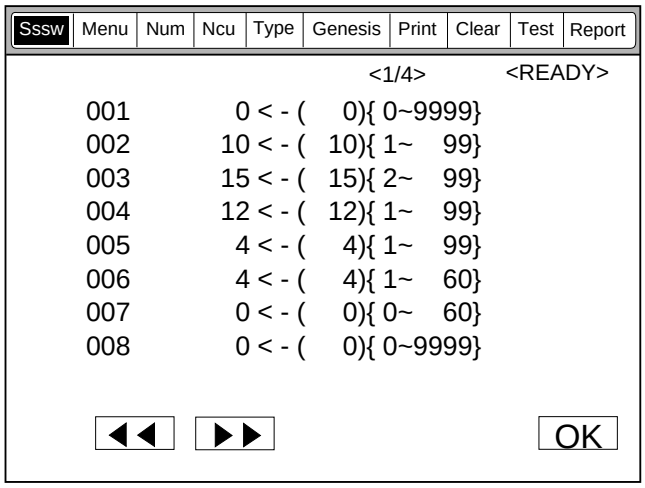

Figure 4-103 #1 SSSW Screen

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#1 SSSW-SW01 error/copy control

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
01	0	Error code for service person	Yes	No	0
	1	Error dump list	Yes	No	0
	2	ID No. for transfer of confidential reception image as part of memory control	No	No	0
	3	Do not change			0
	4	Do not change			0
	5	Do not change			0
	6	Do not change			0
	7	Do not change			0

Bit 0
Use it to specify whether to indicate service error codes. If "Yes" is selected, an appropriate service error code will be indicated on the display and reports.

Bit 1
Use it to specify whether to generate an error dump list. If "Yes" is selected, an error dump list will be attached to an error transmission report and the reception results report generated in the event of an error.

Bit 2
Use it to specify whether to require input of an ID No. when transferring, deleting, or printing a confidential reception image using the Memory Reference key. When "No" is selected, confidential reception images may be transferred, deleted, or printed without an ID No. input.

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#1 SSSW-SW03: echo prevention settings

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
03	0	Do not change			0
	1	Echo protect tone by high-speed transmission	Yes	No	0
	2	Do not change			0
	3	Do not change			0
	4	Transmission mode: international (1)	Yes	No	0
	5	Transmission mode: international transmission (2) or domestic transmission (3)	Yes	No	0
	6	Transmission mode	International (3)	International (2)	0
	7	Tonal signal before CED signal transmission	Yes	No	0

Bit 1
Use it to specify whether to transmit an echo protect tone for high-speed transmission V.29 (9600 bps or 7200 bps) modem signals.
If an error tends to occur often at time of transmission because of line condition, select "Yes" for echo protect tone. When "Yes" is selected, a non-modulation carrier will be transmitted for about 200 ms as a sync signal to precede image data.

Memo
The following is a list of error codes that may occur at time of transmission because of line condition:
##100, ##104, ##281, ##282, ##283, ##750, ##755, ##760, ##765

Bit 7
Use it to specify whether to transmit a tonal signal (1080 Hz) before transmitting a CED signal. If an error tends to occur when receiving data from overseas, select "Yes."

Memo
The following is a list of error codes that may occur at time of reception because of an echo:
#005, #101, #106, #107, #114, #200, #201, #790

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Bit 4, 5, 6
Use it to select transmission mode: international (1), international (2), or international (3).
Select an appropriate mode using dial registration or service soft switch if an error tends to occur often when transmitting data to an overseas destination.

Memo
The following is a list of error codes that may occur at time of transmission because of an echo.
#005, #100, #101, #102, #104, #201, #280, #281, #283, #284, #750, #760, #765, #774, #779, #784, #794

dial registration settings (user level)
Select "international transmission (1)" when using transmission mode registration for one-touch dial or speed dial. If an echo still occurs, select "international transmission (2)," and "international transmission (3)" in the order indicated. The transmission mode selected under one-touch dial/speed dial registration will be given priority over the settings made by the service soft switch.
When a transmission mode is selected using this switch, an international transmission mode may be selected also for transmission using the keypad. For settings, see the following table.

Bit / Transmission mode	7	6	5	4	3	2	1	0
international transmission (1)	*	0	0	1	0	0	*	0
international transmission (2)	*	0	1	0	0	0	*	0
international transmission (3)	*	1	1	0	0	0	*	0

international transmission (1): Ignores the first DIS signal sent by the other device.
international transmission (2): Transmits a 1850-Hz tonal signal when transmitting the DIS signal.
international transmission (3): Transmits a 1650-Hz tonal signal when transmitting the DIS signal.

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#1 SSSW-SW04 communication problem prevention settings

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
04	0	Do not change			0
	1	Do not change			0
	2	Number of last flag sequences (procedure signal)	2	1	0
	3	Reception mode after transmission of CFR signal	High speed	High speed/ Low Speed	0
	4	Time length in which low-speed signal is ignored after transmission of CFR signal	1500ms	700ms	0
	5	Check on frequency of CI signal at time of setting PBX	Yes	No	0
	6	CNG signal for manual transmission	No	Yes	0
	7	CED signal at time of manual reception	No	No	1

Bit 2
Use it to select the appropriate number of last flag sequences for the procedure signal (300 bps). If the procedure signal sent by the device is not received normally by the other device, set it to "2."

Memo

The following is a list of error codes that may occur at time of transmission:
##100, ##280, ##281, ##750, ##753, ##754, ##755, ##758, ##759, ##760, ##763, ##764, ##765, ##768, ##769, ##770, ##773, ##775, ##778, ##780, ##783, ##785, ##788,

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Bit 3
Use it to select an appropriate reception mode after transmission of the CFR signal.
If an error tends to occur often because of line condition during reception, select "high-speed" and, at the same time, select "No" to "ECM reception."

Memo

The following is a list of error codes that may occur because of line condition during reception:
##107, ##114, ##201
Before changing this bit, be sure to change bit 4; if an error still occurs after changing bit 4, change this bit.
If "high-speed" is selected, only high-speed (image) signals will be received after transmission of a CFR signal.

Bit 4
Use it to set a time length during which low-speed signals are ignored after transmission of the CFR signal.
If the line condition is poor and reception of image signals is difficult, select "1500 ms."

Bit 6
Use it to specify whether to transmit a CNG signal at time of manual transmission.

Bit 7
Use it to specify whether to transmit a CED signal at time of manual transmission.
If the other device does not start transmission in response to manual reception mode, select "Yes."

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#1 SSSW-SW5: standard function (DIS signal) settings

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
05	0	Do not change			0
	1	Do not change			0
	2	Do not change			0
	3	Transmit bits after bit 33 of DIS signal	No	Yes	0
	4	Cut paper declaration by DIS signal	Yes	No	0
	5	Do not change			0
	6	Do not change			0
	7	Do not change			0

Bit 3
Use it to specify whether to transmit bits that follow bit 33 of the DIS signal.

Caution:
If you select "No," the Super Fine or memory box functions will be disabled for reception from a non-Canon device.

Bit 4
Use it to specify the use of cut paper for the DIS signal.
If a long-size page is to be received after having it divided by the transmitting device, be sure to select "A4/B4 size."

Memo
Some devices (transmitting) may not be designed to divide long-size pages.

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#1 SSSW-SW6 reading conditions settings

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
06	0	Do not change			0
	1	Do not change			0
	2	Do not change			0
	3	Do not change			0
	4	Do not change			0
	5	Do not change			0
	6	Do not change			0
	7	Photo + Super Fine/Ultra Fine	Yes	No	1

Bit 7
Use it to select an appropriate combination with photo mode: Super Fine or Ultra Fine.

Caution:
The absence (for some reason) of a memory serving as the page memory will disable Ultra Fine or Super Fine.

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#1 SSSW-SW07: closed area connection function setting

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
07	0	Do not change			0
	1	Do not change			0
	2	Do not change			0
	3	Transmit bits after bit 33 of DIS signal			0
	4	Cut paper declaration by DIS signal			0
	5	Do not change			0
	6	Closed area connection reception	Yes	No	0
	7	Closed area connection transmission	Yes	No	0

The closed area connection function is intended for communication with specific faxes only, and is effective only if the other device is equipped with a closed area connection function.

Bit 6
Use it to enable/disable the closed area connection reception function.
If reception from specific faxes is wanted, select "Yes," and set the ID used by such faxes. To set the ID, use the eight bits of SW08.

bit 7
Use it to enable/disabled the closed connection transmission function.
If transmission to specific faxes is wanted, select "Yes," and set the ID used by such faxes. To set the ID, use the eight bits of SW08.
If the selected ID does not match the same ID as the other device, error code #039 will be indicated.

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#1 SSSW-SW08: closed area connection ID settings

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
08	0	Closed area connection ID bit 0			0
	1	Closed area connection ID bit 1			0
	2	Closed area connection ID bit 2			0
	3	Closed area connection ID bit 3			0
	4	Closed area connection ID bit 4			0
	5	Closed area connection ID bit 5			0
	6	Closed area connection ID bit 6	Yes	No	0
	7	Closed area connection ID bit 7	Yes	No	0

To make sure of the closed area connection function, be sure to set the same ID as the other device.

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#1 SSSW-SW09 display settings

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
09	0	Communication results display (normal end)	Yes	No	0
	1	Communication results display (error end)	Yes	No	0
	2	Do not change			0
	3	Do not change			0
	4	Do not change			0
	5	Continuous polling reception	Yes	No	0
	6	Do not change			0
	7	Do not change			0

Bit 0
Use it to specify whether to turn off the results indication in 10 sec for a normal end.
Yes: Keeps the results until a key (any) is pressed.
No: Turns off the results in 10 sec after a normal end.

Bit 1
Use it to specify whether to turn off the results indication in 10 sec for an error end.
Yes: Keeps the results until a key (any) is pressed.
No: Turns off the results in 10 sec after an error end.

Bit 5
Use it to specify whether to use continuous polling reception.
Yes: Keeps ringing until the Stop key is pressed.
No: Disables continuous polling reception.

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#1 SSSW-SW10 remote control

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
10	0	Transfer of memory reception image, transfer of confidential reception image, and transfer of polling transmission image by remote control	No	Yes	0
	1	Transfer of memory reception image by remote control	No	Yes	0
	2	Image memory after transfer of memory reception image or after transfer of confidential reception image by remote control	No	Yes	0
	3	Do not change			0
	4	Do not change			0
	5	Do not change			0
	6	Do not change			0
	7	Do not change			0

Bit 0
Use it to specify whether to prohibit transfer of data in wait state (polling; memory reception image, confidential reception image) by remote control.

Bit 1
Use it to specify whether to prohibit transfer of memory reception images by remote control.

Bit 2
Use it to specify whether to delete image memory after transfer of memory reception images or confidential reception images by remote control. (If transfer ends in error, the settings for error data will be used.)

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#1 SSSW-SW12: page timer settings

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
12	0	1-page time-out time length for transmission	1	0	1
	1		1	0	1
	2	1-page time-out time length for transmission (HT transmission)	1	0	0
	3		1	0	0
	4	1-page time-out time length for reception	1	0	0
	5		1	0	0
	6	Do not change			0
	7	Page timer setting by transmission/reception	Yes	No	0

Use it to set the page timer. The FAX Board is designed so it stops communication if transmission/reception takes 32 min or more. To change the setting, select an appropriate time length by referring to the next page.

If you select "No" using bit 7, the time-out time length for a single page will be determined by Bit 0 and Bit 1 for either mode.

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Time-Out Time Length for Transmission/Reception

Time-out time length \ Bit	7	6	5	4	3	2	1	0
8 min	0	*	*	*	*	*	0	0
16 min	0	*	*	*	*	*	0	1
32 min	0	*	*	*	*	*	1	0
64 min	0	*	*	*	*	*	1	1

Time-Out Time Length for Transmission (no image mode setting)

Time-out time length \ Bit	7	6	5	4	3	2	1	0
8 min	1	*	*	*	*	*	0	0
16 min	1	*	*	*	*	*	0	1
32 min	1	*	*	*	*	*	1	0
64 min	1	*	*	*	*	*	1	1

Time-Out Time Length for Transmission (image mode AA)

Time-out time length \ Bit	7	6	5	4	3	2	1	0
8 min	1	*	*	*	0	0	*	*
16 min	1	*	*	*	0	1	*	*
32 min	1	*	*	*	1	0	*	*
64 min	1	*	*	*	1	1	*	*

Time-Out Time Length for Reception

Time-out time length \ Bit	7	6	5	4	3	2	1	0
8 min	1	*	0	0	*	*	*	*
16 min	1	*	0	1	*	*	*	*
32 min	1	*	1	0	*	*	*	*
64 min	1	*	1	1	*	*	*	*

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#1 SSSW-SW24: pin code function setting

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
24	0	PIN CODE function	Yes	No	0
	1	Forced PIN CODE function	Yes	No	0
	2	Forced PIN CODE mode	Prefix	Suffix	0
	3	Do not change			0
	4	Do not change			0
	5	Do not change			0
	6	Do not change			0
	7	Do not change			0

Bit 0
When connected to a PBX which has restriction function, set 'PIN (Personal Identification Number) CODE function' to 'Yes'.

Bit 1
When “Yes” is selected, allows entry of the PIN CODE number even if the PIN CODE button is not pressed.
(When the Bit 0 “PIN CODE function” is set to 'Yes', this bit is enableds.)

Bit 2
Selects whether the PIN CODE number is entered prior to, or after the telephone number. When set to “1” the other party’s number is sent while dialing, after having sent the PIN CODE.
(When the Bit 1 'Forced PIN CODE function' is set to 'Yes', this bit is enabled.)

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#1 SSSW-SW25: report display function settings

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
25	0	Transmission telephone number indicated on report	Callee	Callee	0
	1	Callee abbreviation indicated on report	Yes	No	0
	2	Do not change			0
	3	Do not change			0
	4	Do not change			0
	5	Continuous polling reception	Yes	No	0
	6	Do not change			0
	7	Do not change			0

Bit 0
Use it to specify which telephone number should be indicated on the report after transmission.
Caller: Indicates the telephone number of the caller.
Callee: Indicates the telephone number (CSI signal data) from the other device.

Memo
If a ring is made not using the one-touch dial or speed dial function, the telephone number (CSI signal data) from the other device will be indicated on the report even if "caller" has been selected.

Bit 1
Use it to specify which abbreviation should be indicated on the report after transmission.
Registered: Indicates the abbreviation of the other device registered under one-touch dial or speed dial directories.
Other device: Indicates the abbreviation (SF signal data) from the other party.

Memo
If no appropriate abbreviation has been registered under the one-touch dial number or the speed dial number used for ringing, the abbreviation (NSF signal data) from the other device will be indicated even if "registered device" has been selected.

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#1 SSSW-SW26: transmission function settings

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
26	0	Do not change			0
	1	Do not change			0
	2	Do not change			0
	3	Do not change			0
	4	Do not change			0
	5	Do not change			0
	6	Other device prohibit for broadcasting	One	All	0
	7	Error report at time of suspension of transmission	No	Yes	0

Bit 6
Use it to specify whether to stop communication to all other devices when broadcasting is stopped.

Bit 7
Use it to specify whether to generate an error report when transmission is stopped by pressing the Stop key.

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#1 SSSW-SW28: V.8/V.34 procedure settings

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
28	0	V.8 procedure for caller	No	Yes	0
	1	V.8 procedure for callee	No	Yes	0
	2	V.8 late start for caller	No	Yes	0
	3	V.8 procedure for caller	No	Yes	0
	4	Fall back from V.34 receiving device	No	Yes	0
	5	Reserved			0
	6	Reserved			0
	7	Reserved			0

Bit 0
Use it to specify whether to execute the V.8 procedure when making a ring.
No: Starts with the V.21 procedure without the V.8 procedure even if a V.8 procedure is received from the callee.

Bit 1
Use it to specify whether to execute the V.8 procedure at time of a ring.
Yes: Starts with the V.21 procedure without the V.8 procedure.

Bit 2
Use it to specify whether to execute V.8 procedure if the ANSam signal from the callee cannot be recognized but the callee declares the presence of the V.8 procedure in the DIS signal.
Yes: Sends a CI signal in response to the DIS signal from the callee, and executes the V.8 procedure.
No: Does not send a CI signal in response to the DIS signal from the callee, and executes the V.21 procedures.
In the case of manual transmission, V.8 late start will not be executed regardless of how the bit is set.

Bit 3
Use it to specify whether to declare the presence of the V.8 procedure for the DIS signal to be sent when the caller cannot recognize the ANSam.
Yes: Declares the presence of the V.8 procedure in the DIS signal and executes the V.8 procedure after the caller transmits a CI signal.
No: Does not declare the presence of the V.8 procedure for the CI signal and executes the V.21 procedure.
In the case of manual transmission, V.8 late start will not be executed regardless of how the bit is set.

Bit 4
Use it to specify whether to prohibit fall back initiated by the V.34 receiving device.
Yes: Prohibits fall back initiated by the receiving device.

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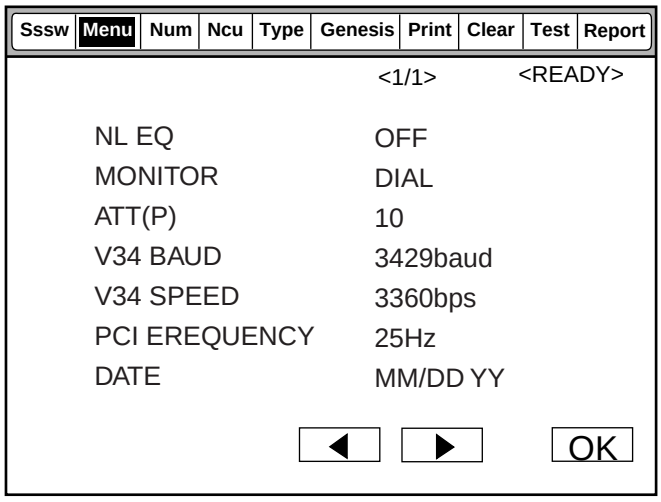
5. Menu Switch Settings (#2 MENU)



	Function	Settings
NL EQ	NL equalizer	ON/OFF
MONITOR	Telephone line monitor	DIAL/SERVICEMAN/OFF
ATT (P)	Transmission level (ATT)	0 to 15
V34 BAUD	V.34 modulation speed upper limit	2400 to 3429
V34 SPEED	V.34 data speed upper limit	2400 to 33600
PCI FREQUENCY	Pseudo CI signal frequency	50Hz/25Hz/17Hz
DATE	Date format	'YY MM/DD,MM DD/YY, DD/MM 'YY

NL EQ Use it to turn on or off the NL EQNL equalizer.
If an error tends to occur often because of line condition, be sure to turn it on.

Memo

The following is a list of errors that may occur because of line condition at time of transmission.
##100, ##101, ##102, ##104, ##201, ##281, ##282, ##283, ##750, ##755, ##765, ##774, ##779, ##784, ##789
The following is a list of error codes that may occur because of line condition at time of reception:
##103, ##107, ##114, ##201, ##790, ##793

MONITOR: Use it to set the telephone line monitor function.
DIAL: Use it to turn on the telephone line circuit monitor sound from the speaker between start of transmission and DIS.
SERVICEMAN: Use it to turn on the monitor sound of the telephone line from the speaker between start and end of communication.
OFF: Use it to turn off the monitor sound of the telephone line from the speaker.

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ATT: Use it to set the transmission level (ATT).
If an error tends to occur often because of line condition, increase the transmission level.

Memo

The following is a list of error codes that may occur because of line condition:
##100, ##101, ##102, ##104, ##201, ##280, ##281, ##282, ##283, ##284, ##750, ##752, ##754, ##755, ##757, ##759, ##760, ##762, ##764, ##765, ##767, ##769, ##770, ##772, ##774, ##775, ##777, ##779, ##780, ##782, ##784, ##785, ##787, ##789
The following is a list of error codes that may occur because of line condition.
##103, ##106, ##107, ##201, ##793

V.34 BAUD: Use it to set the upper limit for the modulation speed (baud rate) for the V.34 primary channel.

V.34 SPEED: Use it to set the upper limit for the data transmission speed for the V.34 primary channel between 2.4 k and 33.6 kbps in 2400-bps increments.

PCI FREQUENCY: Use it to set the frequency for the pseudo CI signal.
With some external telephones, a ring may not be sounded when the FAX/TEL switch function is triggered. If the sound is not heard, be sure to change the frequency of the pseudo CI signal.

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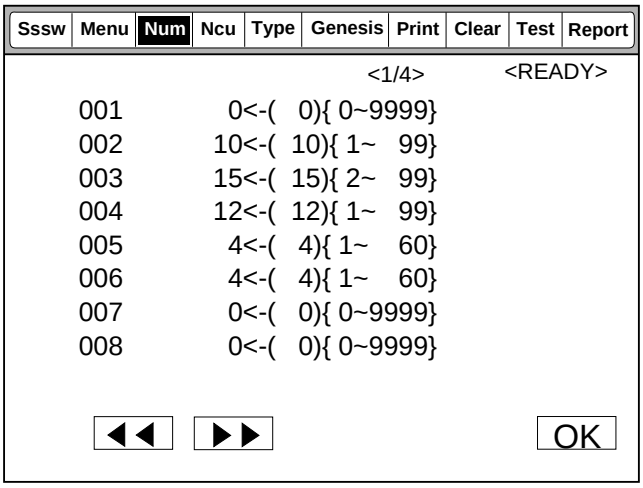
6. Various Numerical Settings (#3 NUMERIC Param.)



No.	Description	Settings
02	RTN signal transmission condition (1)	1 to 99 (%)
03	TN signal transmission condition (2)	2 to 99 (times)
04	RTN signal transmission condition (3)	1 to 99 (lines)
05	NCC pause length (before ID code)	1 to 60 (sec)
06	NCC pause length (after ID code)	1 to 60 (sec)
09	comparison between caller and callee telephone numbers	0 to 20 (digits)
10	line connection identification time length	0 to 9999 (x 10ms)

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No. 02, 03, 04
Use it to specify RTN signal transmission conditions. If an error tends to occur often as a result of transmitting an RTN signal at time of reception, increase the parameters to relax the RTN signal transmission conditions.

Memo

The following errors may occur as a result of transmitting an RTN signal at time of reception: ##104, ##107, ##114, ##201.
The RTN signal transmission condition (1) represents the ratio of error lines to total lines on a single received page.
The RTN signal transmission condition (2) represents the reference value** for a burst error*.
The RTN signal transmission condition (3) represents the number of errors (falling short of the burst error standard value).
*Transmission error continuing over several lines.
**If '15' is set, for instance, a transmission error continuing over 15 lines will be identified as a burst error.
If any of the conditions is detected while receiving image data, the device will send an RTN signal after it has received a procedure signal of the transmitting device. Increasing these parameters will accordingly hinder transmission of the RTN signal.

No. 05
Use it to set the length of the pause which will automatically be inserted between an access code and an ID code when a number is dialed using the NCC (New Common Carrier) line.
No. 06
Use it to set the length of the pause which will automatically be inserted between an ID code and the telephone number of the callee.

No. 09
Use it to set the number of digits for comparison between the TSI of the other device and the appropriate telephone number registered under the one-touch dial or speed dial directory (when restrictions are imposed on destination telephone numbers in relation to the direct mail prevention function or the memory box function).
Be sure to change, if necessary, this parameter before registering telephone numbers.

No. 10
Use it to set the time length for line connection identification. Raise the parameter if an error tends to occur often because of line condition.

Memo

The following errors may occur because of line condition: ##005, ##018.
The time length of connection identification is between the transmission of the dial signal and the termination of the line for the transmitting device, while it is between the transmission of the DIS signal and the termination of the line for the receiving device.

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7. NCU Settings (#4 NCU)

a. 10. SPECIAL (special switch settings)

#4 NCU-SW01: data decoding method/independent abbreviation procedure settings

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
01	0	MR, MMR coding method	No	Yes	0
	1	MMR coding method	No	No	0
	2	CEP	No	Yes	0
	3	CEP II	No	Yes	0
	4	Do not change			0
	5	Do not change			0
	6	Do not change			0
	7	Do not change			0

Bit 0, 1

Use it to select a data coding method for communication. If 'No' is selected, the MH coding method will solely be used.

Bit 1

Use it to select a data coding method for communication. If 'No' is selected, the MH or MR coding method will solely be used. If a faulty image occurs as a result of selecting the MMR coding method, be sure to select 'No'. This bit is effective when bit 0 is 'No'.

Memo

The coding method will be as follows based on combinations of bit 0 and bit 1:

Bit 0	Bit 1	Coding method selected
0	0	MMR or MR or MH
0	1	MR or MH
1	0	MH
1	1	MH

Bit 2, 3

Use it to select CEP or CEP II for communication.

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#4 NCU-SW04: end sound ring setting

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
04	0	Do not change			0
	1	Memory reception end sound	Yes	No	0
	2	Do not change			1
	3	Do not change			0
	4	Do not change			0
	5	Do not change			0
	6	Do not change			0
	7	Do not change			0

Bit 1
Use it to specify whether to generate a sound at the end of reception in memory reception mode.

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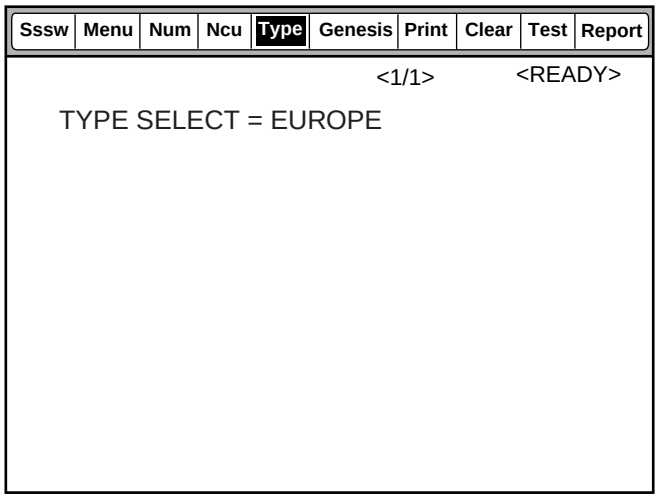
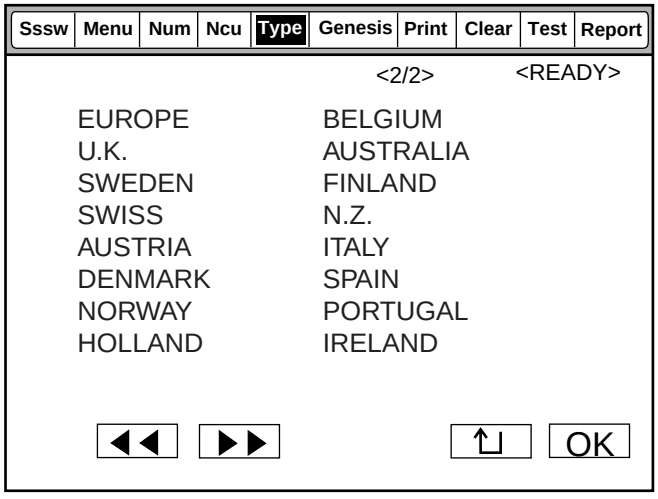
8. Site Settings (#5 TYPE)

When the type shown on the display is set, all the service data is set to match each country's domestic telecommunication standards.

The initial screen for Type will be as shown below.
The screen highlights to indicate the currently selected item. For the purpose of explanation, the item EUROPE is selected on the sample screen.



Selecting TYPE SELECT will bring up the Type Setting screen shown below.



9. GENESIS Settings (#6 GENESIS)

Do not change the settings. Otherwise, the image quality may be lost.

10. Printer Parameter Settings (#7 PRINTER)

a. Service Soft Switch Settings

#7 PRINTER-SW05 (reduction, cassette selection)

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
05	0	Priority on LTR	Yes	No	1
	1	Priority on LGL	Yes	No	1
	2	Do not change			0
	3	Do not change			0
	4	Reduction and printing on A	No	Yes	0
	5	Reduction and printing on LTR	No	Yes	0
	6	Do not change			0
	7	Priority to sub scanning	Yes	No	0

Bit 0
Use it to specify whether to give priority to LTR over LTR or LGL when data which may be printed on either by division is received.

Bit 1
Use it to specify whether to give priority to LGL over A4 or LTR when data which may be printed on either by division is received.
The order of priority will be as follows according to the bit 0 and 1 settings:

Bit 0	Bit 1	Order of priority
0	0	A4 → LTR → LGL
0	1	LTR → A4 → LGL
1	0	LGL → LTR → A4
1	1	LTR → LGL → A4

If sub scanning is given priority, the order will be LTR → A4 → LGL even when bit 1 and 1 are set to 0.

Bit 4
Use it to specify whether to reduce and print on A4 paper.
If printing on non-A4 paper without reduction is desired when a long-size page is received, be sure to select 'No'.

Bit 5
Use it to specify whether to reduce and print on LTR paper.
If printing on non-LTR paper without reduction is desired for a long-size page, be sure to select 'No'.

Bit 7
Use it to specify whether to place priority on sub scanning direction.

Yes: If B4 and A4 are set and an A4 long-size page* is received, prints on B4.

No: If B5R and A4 are set and an B4 page is received, divides and prints on B5R.

*Page B4 or less in length and which cannot be reduced for printing on A4.

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#7 PRINTER-SW06 (reduction setting)

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
06	0	Reduction for division	No	Yes	0
	1	Do not change			1
	2	Do not change			0
	3	Do not change			0
	4	Do not change			0
	5	Do not change			0
	6	Do not change			0
	7	Do not change			0

Bit 0
Use it to specify whether to reduce a received long-size page if it may be divided and printed by reduction by the highest percentage (70%).
No: Divides and prints on the next page (100%).
Yes: Reduces for division and prints on the page.

#7 PRINTER-SW11 (recording control setting)

SW No.	Bit No.	Description	Bit setting		Default
			1	0	
11	0	Do not change			0
	1	Do not change			0
	2	Printing after recognition of reception printing	Yes	No	0
	3	Do not change			0
	4	Do not change			0
	5	Do not change			0
	6	Do not change			0
	7	Do not change			0

Bit 2
Yes: Prints after recognition of a reception file.
No: Prints after recognition of each reception page.

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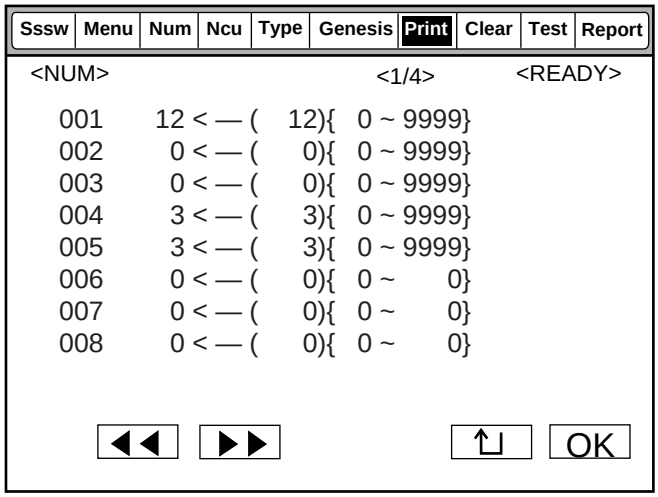

No.	Description	Settings
01	Missing image area of long-size page	0 to 9999
04	Leading edge margin	0 to 9999
05	Trailing edge margin	0 to 9999

No. 1
Use it to specify the size of a blank when printing a long-size page.
If the trailing edge of a received page is needed when a page longer than the effective recording area is received, be sure to lower the parameter to limit the area.

Bit 4
Use it to set the leading edge margin for effective recording length.

Bit 5
Use it to set the trailing edge margin for effective recording length.

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11. Initializing the Settings (#8 CLEAR)

Each data item may be initialized independently of others as follows. The default setting (effective at time of shipment) will take the place of each setting and parameter.

Item	Data item
TEL	Contents registered under TEL registration: one-touch dial, speed dial, group dial. Contents of memory control (user data)
USSW SW	Contents registered under user data and SSSW#1 through #3 The contents of memory control (user data) will not be cleared. The image data stored in memory will be cleared.
SERVICE SW	User data and contents of SSSW#1 through #3, #6, #7
NCU	Contents of SSSW#4
SERVICE DATA	Contents of system dump list
REPORT	Contents of communications control report
ALL	All settings/registered data items
COUNTER	Reading page count/communication control numbers

12. Displaying ROM Information (#9 ROM)

This item serves the same function as the function under DISPLAY 04 in the copier's service mode (*1*).

To check the ROM version, be sure to execute DISPLAY 04 in the copier's service mode.

(The program used to control the fax functions is the ROM DIMM mounted on the copier's image processor PCB.)

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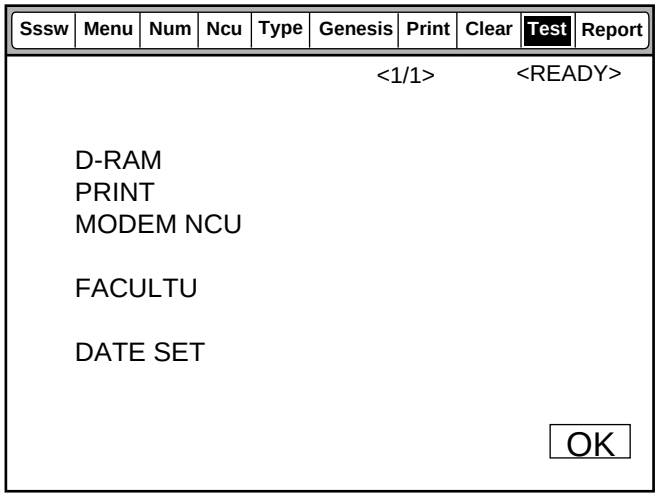
C. Test Mode (#10 TEST)



D-RAM
Use it to make a write/read check on data for the entire area of the D-RAM. If installed, an expansion memory will also be covered.

PRINT
Use it to generate a test print.

VIDEO
Use it to store images read by the scanner in the image memory without coding, or to print such images from the memory.

MODEM NCU
Use it to execute transmission/reception test on the modem and NCU.

FACULTY
Use it to execute a functions test.

DATA SET
Not used in the field (for factory only).

Operation
- Press the appropriate item to highlight, and then press the OK key to bring up the screen of the item.

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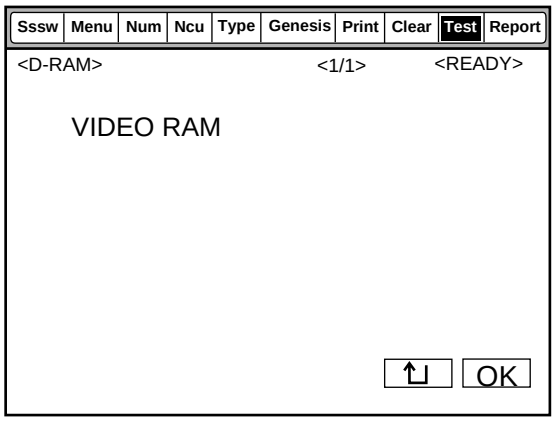
1. D-RAM Test

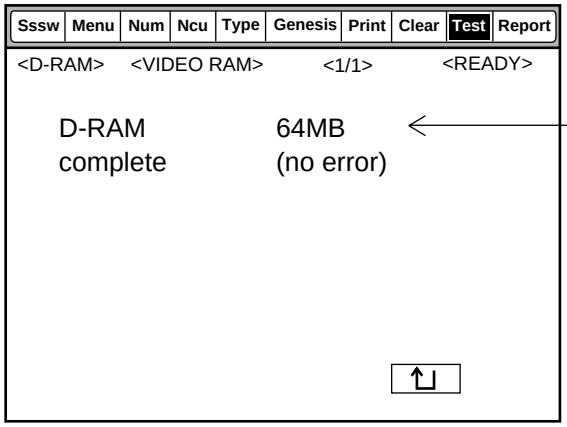
Use it to make a write/read check on data for the entire area of the D-RAM. If installed, an expansion memory will also be covered.

Executing a D-RAM test will delete all image data in the memory. If any image exists in the memory, be sure to generate it before executing the item.



Operation

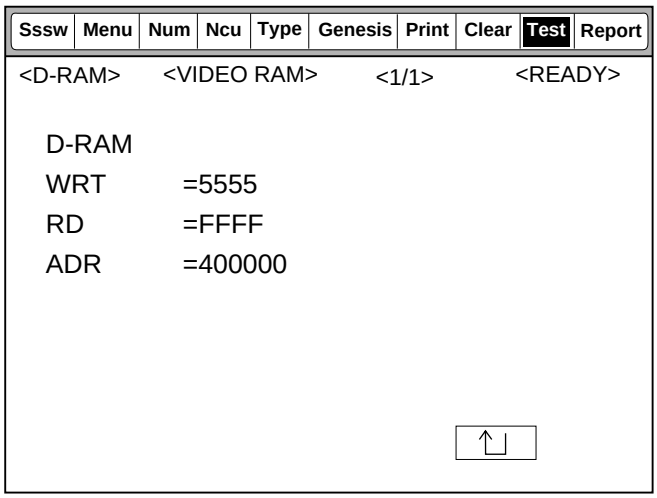
1) Bring up the above screen. Press 'VIDEO RAM' on the screen to highlight, and then press the OK key.
   - The D-RAM test will start.
2) See that the following screen appears to show the result of the test.



Size of the D-RAM (in bytes). The indication will differ depending on the presence of an expansion memory.

If an error is found, the D-RAM test will be suspended and the following screen will appear:

Error Display Screen



Error Indications
D-RAM: type of RAM in error
WRT: data written
RD: data read
ADR: address

Action to Take in Response
- If an expansion memory has been installed, poor contact may be considered. Disconnect and then connect the memory, and execute the D-RAM test once again.
- If an error still occurs after executing the D-RAM test two to three times, replace the FAX board or the expansion memory.

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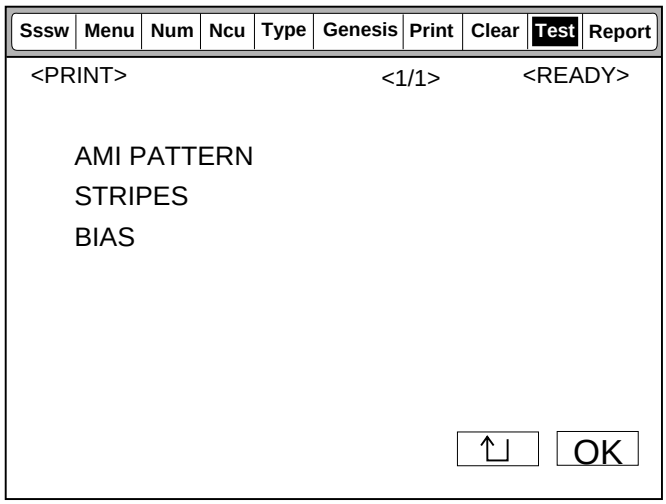
2. PRINT Test

The following parameters will be used for the test pattern:

Recording size: A4H
Resolution: Fine
Pattern: Ami Pattern (for factory)
Stripes (vertical lines)
Bias (diagonal lines)
Rotation: Rotation is executed if for A4H; it is not executed if for A4R.



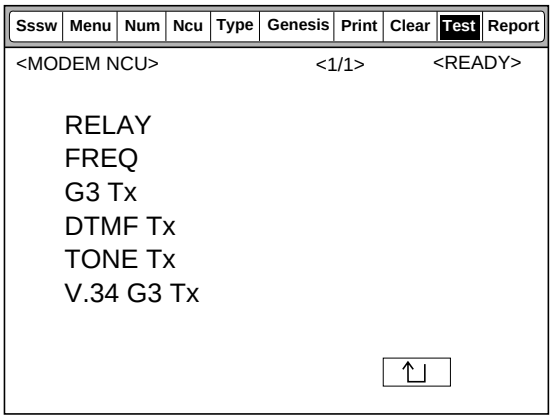
Operation

1) Select and press the print pattern you want from among the items indicated on the screen; then, press the OK key.
   · A test print will be generated.

3. MODEM NCU Test

The modem and NCU will be tested for transmission and reception. This mode consists of the following six items:

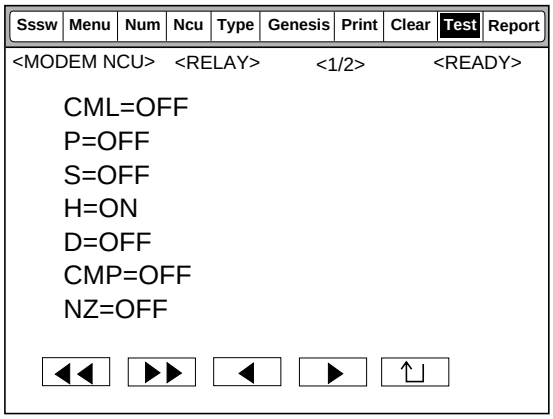
Modem NCU Menu Screen



a. Relay Test (RELAY)

Press 'RELAY' on the MODEM NCU Menu screen, and then press the OK key so that relay mode will start and the following screen will appear.

The relay is turned on and off in response to a press on each item.



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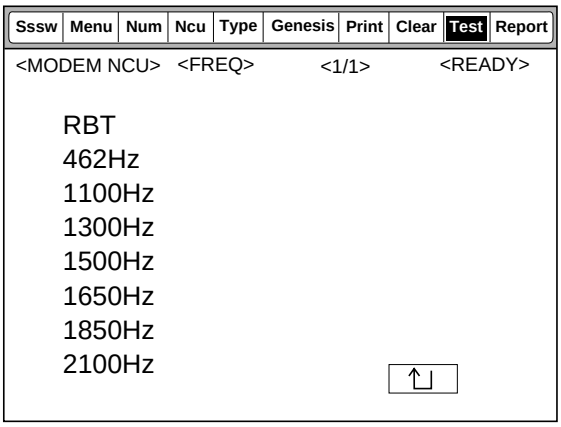
b. Frequency Test (FREQ)

Press 'FREQ' on the MODEM NCU Menu screen to start frequency test mode and bring up the following screen:

Select and press an item from among the list of items indicated so that the tone generation function of the modem will be used to generate a tone at the selected frequency after closing the direct current circuit. You can also monitor the transmission signals coming out of the speaker.

To stop the operation, press the [↑⌋] key.

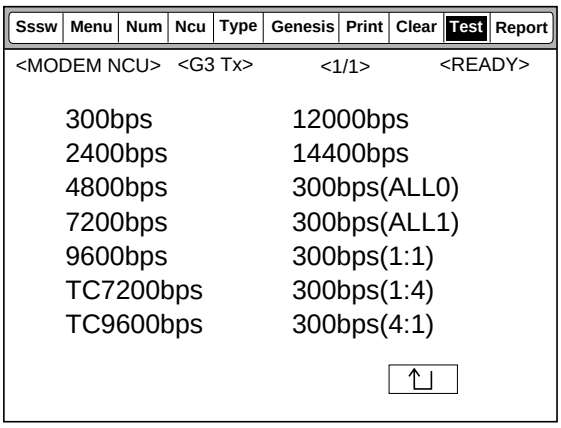


c. G3 Signal Transmission Test (G3 Tx)

Press 'G3 Tx' on the MODEM NCU Menu screen to start G3 transmission test and to bring up the following screen:

Select and press an item from the list of items indicated so that the G3 signal transmission function of the modem will be used to generate a tone at the selected frequency after closing the direct current circuit. You can also monitor the transmission signals coming out of the speaker.

To stop the operation, press the [↑⌋] key.



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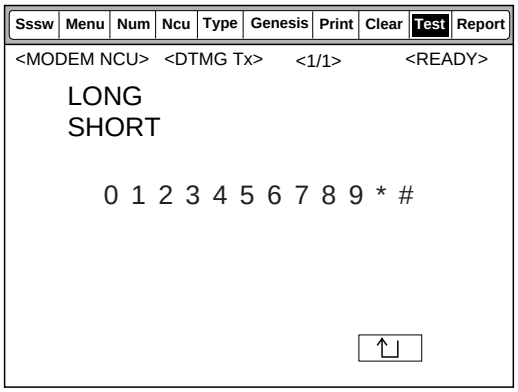
d. DTMF Transmission Test (DTMF Tx)

Press 'DTMF Tx' on the MODEM NCU Menu screen to start DTMF transmission test and to bring up the following screen:

Select and press an item from among the list of items indicated so that signals are transmitted using the DTMF transmission function of the modem after closing the direct current circuit. You can also monitor the transmission signals coming out of the speaker.

- A DTMF signal is transmitted in response to a press on the keypad, *, or # key.
- The indication representing the key that has been pressed is highlighted.
- The following may be selected to specify how long DTMF is transmitted:
  - LONG: transmit until the next key is pressed.
  - SHORT: transmit for about 100 msec.
- To stop operation, press the [↑⌴] key.



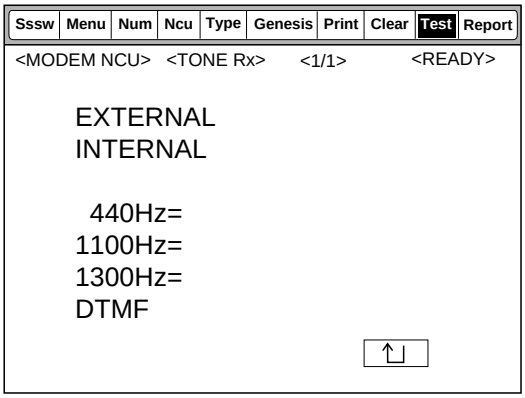
e. Tone Signal Reception Test (TONE Rx)

Press 'TONE Rx' on the MODEM NCU Menu screen to start tone signal reception test mode and to bring up the following screen.

The direct current circuit will be closed, and DTMF signals are detected at the selected frequency using the tone detection function and the DTMF reception function of the modem. The frequencies are as follows:

462 ±14 Hz
1100 ±30 Hz
2100 ±25 Hz

To stop the operation, stop the [↑⌴] key.



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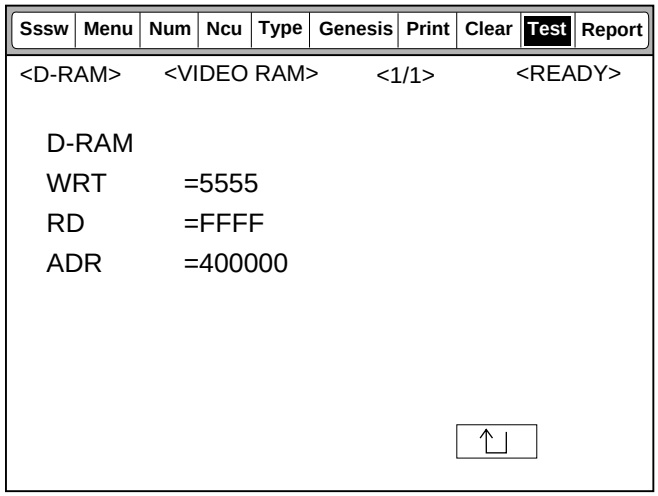
f. V.34 G3 Signal Transmission Test (V.34 G3 Tx)

Press 'V.34 G3 Tx' on the MODEM NCU Test Menu screen to start V.34 G3 signal transmission test mode and to bring up the following screen.

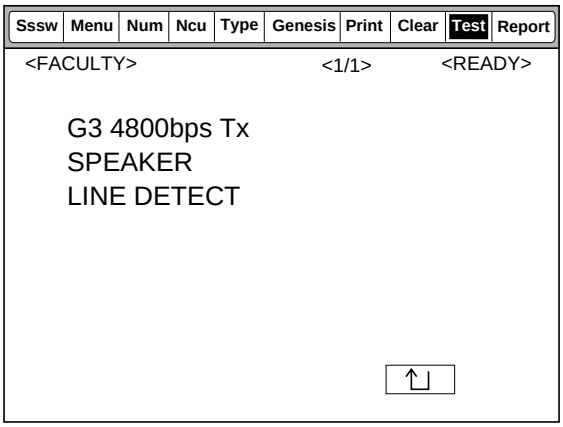
Select a transmission speed and a modulation speed (baud rate) to transmit V.34 G3 transmission signals to the telephone line terminal and the speaker.

To stop the operation, press the [↑⌴] key.



4. Functions Test (FACULTY)

Use this item to execute an appropriate function for testing.

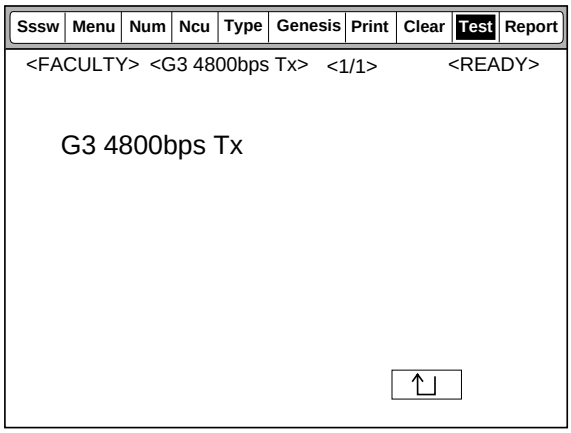


a. G3 Signal Transmission Test (G3 4800 bps Tx)

Press 'G3 4800 Tx' on the FACULTY TEST menu screen to start G3 signal transmission test mode and bring up the following screen.

The direct current circuit will be closed, and signals will be transmitted at 4800 bps using the G3 signal transmission function of the speaker. You can also monitor these transmission signals coming out of the speaker.

To stop the operation, press the ↑⌋ key.



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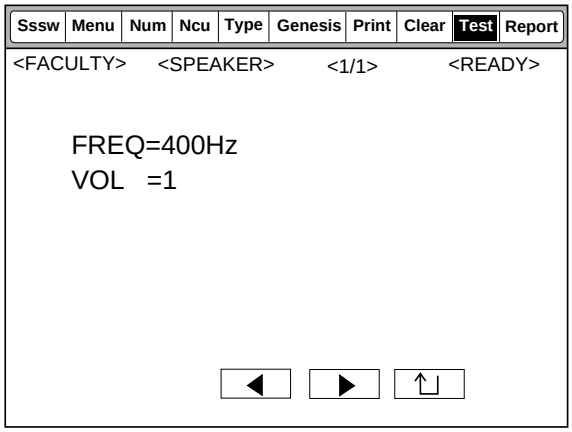
b. Speaker Test (SPEAKER)

Press 'SPEAKER' on the FACULTY TEST Menu screen to start speaker test mode and to bring up the following screen:

The speaker will generate sounds at the selected frequency.

To stop the operation, press the [↑⌊] key.

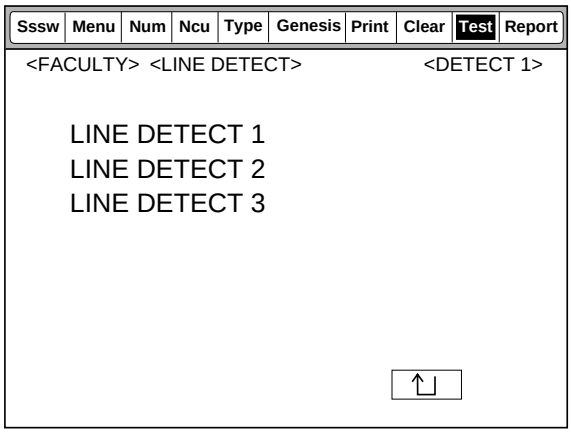
- Press 'FREQ' to highlight and then the appropriate arrow key to increase/decrease the frequency at 100-Hz intervals.
- Press 'VOL' to highlight and then the appropriate arrow key to increase the volume between 1 and 8.
  - 1: minimum level of sound
  - 8: maximum level of sound



c. Line Test (LINE DETECT)

Press 'LINE TEST' on the FACULTY TEST Menu screen to start line mode and to bring up the following screen.

Use this mode to execute testing on the sensors associated with the NCU and frequency counter.

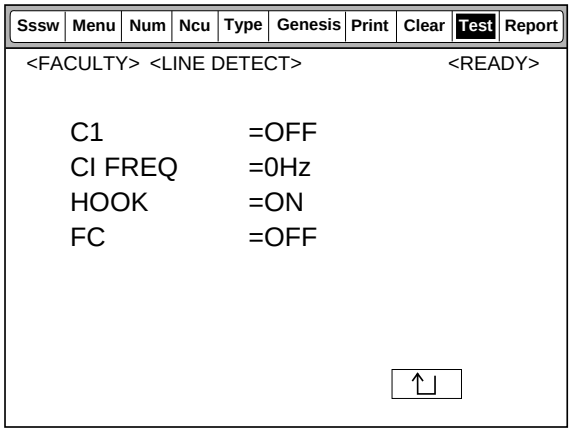


(1) LINE DETECT 1

Press 'LINE DETECT 1' on the Line Test Menu screen to highlight and then the OK key to bring up the following screen:

Use this function to check CI and FC from the line and the state (on/off) of hooking.

For CI, the applicable frequency is also indicated (0 with CI off, '0'; with CI on, its frequency).



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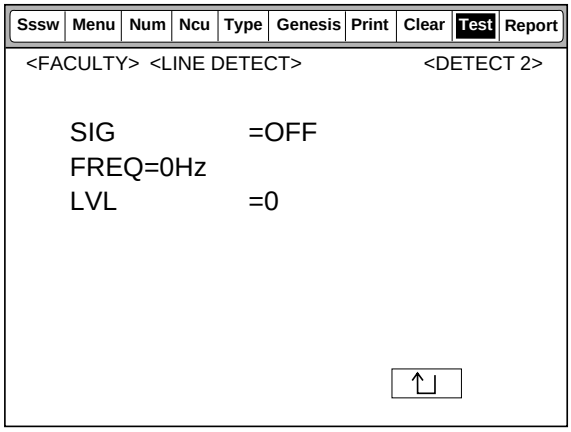
(2) LINE DETECT 2

Press 'LINE DETECT 2' on the Line Test Menu screen to highlight and then the OK key to bring up the following screen:

Use this item to turn on CNL or P relay so as to check the presence of signals or the frequency of signals from the line using the tonal counter.



· Be sure to select the appropriate level for use during detection.

	Level of detection (dbm)
Level 0	-25.96 or higher
Level 1	-30.66 or higher
Level 2	-32.96 or higher
Level 3	-35.96 or higher
Level 4	-38.46 or higher
Level 5	-40.96 or higher
Level 6	-44.70 or higher
Level 7	-9.71 or higher

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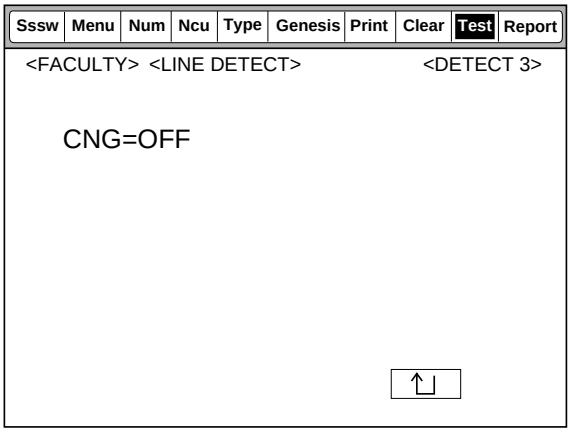
(3) LINE DETECT 3

Press 'LINE DETECT 3' on the Line Test Menu screen to bring up the following screen:

Use this item to check CNG signals by PLL.

When this item is executed, a direct current is supplied between L1 and L2, and the extension telephone is put off hook; signals are then introduced from the line or the extension telephone at 1100 Hz (CNG). Upon detection of a signal, the screen will indicate 'ON'.



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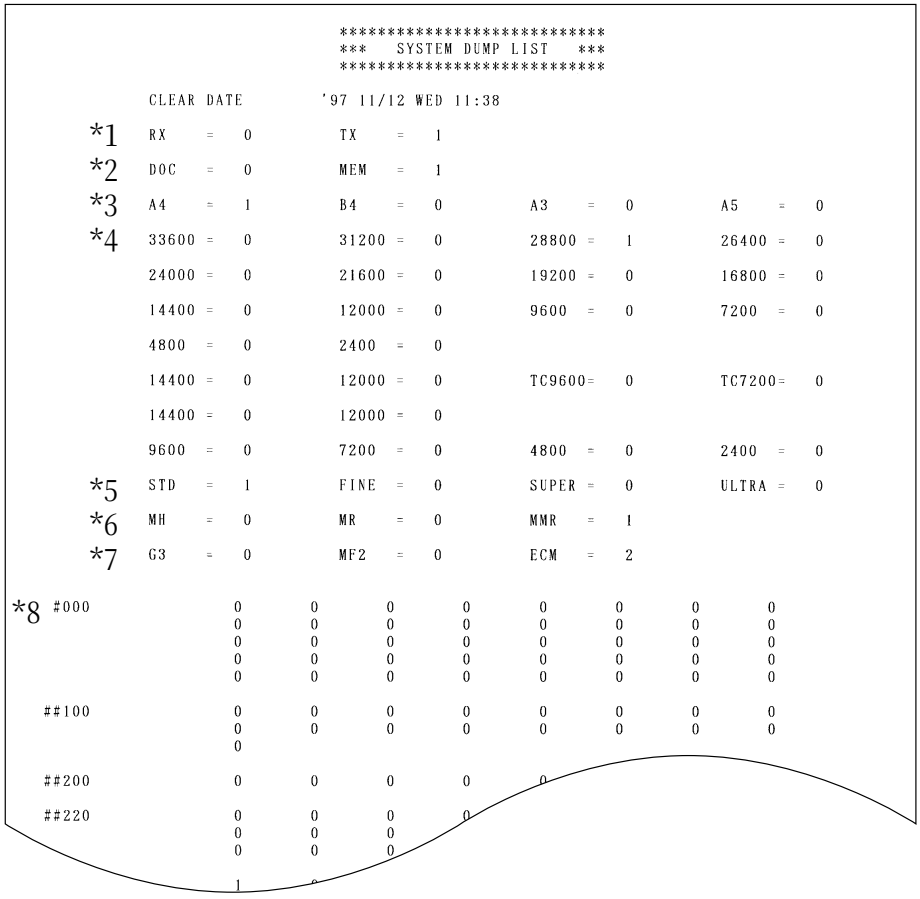
II. SERVICE REPORT

A. System Dump List

The system dump list provides a history of past communications and error communications.



```
                          ****************************
                          ***   SYSTEM DUMP LIST   ***
                          ****************************

        CLEAR DATE        '97 11/12 WED 11:38
   *1   RX    =  0        TX    =  1
   *2   DOC   =  0        MEM   =  1
   *3   A4    =  1        B4    =  0        A3    =  0        A5    =  0
   *4   33600 =  0        31200 =  0        28800 =  1        26400 =  0
        24000 =  0        21600 =  0        19200 =  0        16800 =  0
        14400 =  0        12000 =  0        9600  =  0        7200  =  0
        4800  =  0        2400  =  0
        14400 =  0        12000 =  0        TC9600=  0        TC7200=  0
        14400 =  0        12000 =  0
        9600  =  0        7200  =  0        4800  =  0        2400  =  0
   *5   STD   =  1        FINE  =  0        SUPER =  0        ULTRA =  0
   *6   MH    =  0        MR    =  0        MMR   =  1
   *7   G3    =  0        MF2   =  0        ECM   =  2

*8 #000          0   0   0   0   0   0   0   0
                 0   0   0   0   0   0   0   0
                 0   0   0   0   0   0   0   0
                 0   0   0   0   0   0   0   0
                 0   0   0   0   0   0   0   0

   ##100         0   0   0   0   0   0   0   0
                 0   0   0   0   0   0   0   0
                 0

   ##200         0   0   0   0   0

   ##220         0   0   0   0
                 0   0   0
                 0   0   0

                 1   0
```

Figure 4-201

1: Where RX standards for the total number of received pages, and TX stands for the total number of transmitted pages.
2: Where DOC stands for the number of pages sent in direct transmission mode, and MEM stands for the number of pages sent in memory transmission mode.
3 Indicates the number of pages sent/received by original size.
4: Indicates the number of pages sent/received by mode.
5: Indicates the number of pages sent/received by modem speed (Standard, Fine, Super Fine, Ultra Fine).
6: Indicates the number of pages sent/received by coding method.
7: Indicates the number of communications pages sent/received by mode (MF2 refers to F Net for 1300 Hz communications).
8: Indicates the number of error codes.

Display Example

##280	1	7	3	0	0
	Number of ##280 errors	Number of ##281 errors	Number of ##282 errors		

Provides information on errors in the most recent three communications.

```
#1 LATEST                          ##765

          START TIME                12/26 21:40
          OTHER PARTY               3304
          MAKER CODE                10001000
          MACHINE CODE              10101010 00000000
          RCV V.8 FRAME             E0  81  85  D4  90  7E  00  00
          SYMBOL RATE               3429 baud
          DATA RATE                 26400 bps (V.34)
          TX LVL REDUCTION           0
          ERR ABCODE                92
          ERR SECTXB                8a
          ERR SECRXB                80
          Rx : (bit 1) 00000100 01110111 01010101 00100011 00000001 10101011 11000001 (bit56)
               (bit57) 00000001 00000001 00000100 00000000 00000000                   (bit96)
          Tx : (bit 1) 00000000 01000000 00011111 00100010 00000000 00000000 00000000 (bit56)
```

Rx : NSF DIS CFR
Tx : NSS DCS PIX-264 PPS-EOP PPS-EOP PPS-EOP DCN

```
#2                                 ##765

          START TIME                12/26 21:37
          OTHER PARTY               3304
          MAKER CODE                10001000
          MACHINE CODE              10101010 00000000
          RCV V.8 FRAME             E0  81  85  D4  90  7E  00  00
          SYMBOL RATE               3429 baud
          DATA RATE                 26400 bps (V.34)
          TX LVL REDUCTION           0
          ERR ABCODE                92
          ERR SECTXB                8a
          ERR SECRXB                80
          Rx : (bit 1) 00000100 01110111 01010101 00100011 00000001 10101011 11000001 (bit56)
               (bit57) 00000001 00000001 00000100 00000000 00000000                   (bit96)
          Tx : (bit 1) 00000000 01000000 00011111 00100010 00000000 00000000 00000000 (bit56)
```

Rx : NSF DIS CFR
Tx : NSS DCS PIX-264 PPS-EOP PPS-EOP PPS-EOP DCN

```
#3 OLDEST                          ##201

          START TIME                12/26 21:36
          OTHER PARTY
          MAKER CODE                10001000
          MACHINE CODE              10101010 00000000
          Rx : (bit 1) 00000000 01000100 00011111 00100010 00000000 00000000 00000000 (bit56)
          Tx : (bit 1) 00000000 11110111 01011111 00100011 00000001 11111011 11000000 (bit56)
```

Rx : NSS DCS PIX DCN
Tx : NSF DIS CFR

Figure 4-202 System Dump List (page 2)

1: Indicates a service error code.
2: Where START TIME represents date and time (in 24-hour format).
3: Where OTHER PARTY represents the telephone number received from the other party.
4: Where MAKER CODE represents a manufacture code.
5: Where MACHINE CODE represents a model code.
6: Indicates DIS, DCS, or DTC bit 1 through bit 48 received.
7: Indicates DIS, DCS, or DTC bit 1 through bit 48 sent.
8: Where RX represents the received procedure signal, and TX represents the transmitted procedure signal.

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B. Error Transmission Report

An error transmission report consists of an error transmission report with the attachment of service error codes and error dump lit.

```
                          ****************************
                          ***   ERROR TX REPORT    ***
                          ****************************

          TX FUNCTION WAS NOT COMPLETED

          TX/RX NO                  1180
          CONNECTION TEL            03
          SUB-ADDRESS
          CONNECTION ID             TEST1 33600
          ST. TIME                  09/16 18:10
          USAGE T                   00'47
          PGS.                      1
          RESULT                    NG
                                      1        ##765

     START TIME              09/16 18:10
     OTHER PARTY             03
     MAKER CODE              10001000
     MACHINE CODE            10101010 00000000
     Rx : (bit 1) 00000000 01110111 01010101 00100011 00000001 10101001 00000001 (bit56)
          (bit57) 00000001 00000001 00000100 00000000 00000000                   (bit96)
     Tx : (bit 1) 00000000 01000110 00011111 00100010 00000000 00000000 00000000 (bit56)

Rx : NSF CSI DIS         CFR

Tx :             NSS DCS     PIX PPS-EOP PPS-EOP PPS-EOP DCN
```

Figure 4-203 Error Transmission Report (for servicing)

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C. Error Reception Results Report (for servicing)

A reception results report is a reception results report with the attachment of service error codes and error dump list.

```
                          **********************
                          ***   RX REPORT    ***
                          **********************

          INCOMPLETE RECEPTION

          TX/RX NO                    5987
          CONNECTION TEL
          SUB-ADDRESS
          CONNECTION ID
          ST. TIME                    09/16 18:26
          USAGE T                     00'20
          PGS.                        1
          RESULT                      NG
                                        1         ##106

     START TIME                 09/16 18:26
     OTHER PARTY
     MAKER CODE                 10001000
     MACHINE CODE               10101010 00000000
     RCV V.8 FRAME              E0  81  85  D4  90  7E  00  00
     SYMBOL RATE                3429 baud
     DATA RATE                  33600 bps (V.34)
     TX LVL REDUCTION            0
     ERR ABCODE                 92
     ERR SECTXB                 8a
     ERR SECRXB                 80
     Rx : (bit 1) 00000000 01000000 00011111 00100010 00000000 00000000 00000000 (bit56)
     Tx : (bit 1) 00000100 01110111 01011111 00100011 00000001 11111000 00000000 (bit56)

Rx :          NSS DCS      PIX-336
Tx : NSF DIS          CFR
```

Figure 4-204 Error Reception Results Report (for servicing)

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D. Default Setting List

TYPE	EUROPE	U.K.	SWEDEN	SWISS	AUSTRIA	DENMARK
#1 SSSW						
SW01	00000000	00000000	00000000	00000000	00000000	00000000
SW02	00000000	00000000	00000000	00000000	00000000	00000000
SW03	00000000	00000000	00000000	00000000	00000000	00000000
SW04	10000000	10000000	10000010	10000010	10000010	10000000
SW05	00000000	00000000	00000000	00000000	00000000	00000000
SW06	10000000	10000000	10000000	10000000	10000000	10000000
SW07	00000000	00000000	00000000	00000000	00000000	00000000
SW08	00000000	00000000	00000000	00000000	00000000	00000000
SW09	00000000	00000000	00000000	00000000	00000000	00000000
SW10	00000000	00000000	00000000	00000000	00000000	00000000
SW11	00000000	00000000	00000000	00000000	00000000	00000000
SW12	00000011	00000011	00000011	00000011	00000011	00000011
SW13	00000000	00000000	00000000	00000000	00000000	00000000
SW14	00000000	00000000	00000000	00000000	00000000	00000000
SW15	00000000	00000000	00000000	00000000	00000000	00000000
SW16	00000000	00000000	00000000	00000000	00000000	00000000
SW17	00000000	00000000	00000000	00000000	00000000	00000000
SW18	00000000	00000000	00000000	00000000	00000000	00000000
SW19	10011000	10011000	10011000	10011000	10011000	10011000
SW20	00000000	00000000	00000000	00000000	00000000	00000000
SW21	00000000	00000000	00000000	00000000	00000000	00000000
SW22	00000000	00000000	00000000	00000000	00000000	00000000
SW23	00000000	00000000	00000000	00000000	00000000	00000000
SW24	00000000	00000000	00000000	00000000	00000000	00000000
SW25	00000000	00000000	00000000	00000000	00000000	00000000
SW26	00000000	00000000	00000000	00000000	00000000	00000000
SW27	00000000	00000000	00000000	00000000	00000000	00000000
SW28	00000000	00000000	00000000	00000000	00000000	00000000
SW29	00000000	00000000	00000000	00000000	00000000	00000000
SW30	00000000	00000000	00000000	00000000	00000000	00000000
#2 MENU						
05:	OFF	OFF	OFF	OFF	OFF	OFF
06:	DIAL	DIAL	DIAL	DIAL	DIAL	DIAL
07:	10	10	10	10	9	10
08:	3429	3429	3429	3429	3429	3429
09:	33600bps	33600bps	33600bps	33600bps	33600bps	33600bps
10:	25Hz	25Hz	25Hz	25Hz	25Hz	25Hz
35:	DDMMYY	DDMMYY	YYMMDD	DDMMYY	DDMMYY	DDMMYY

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TYPE	NORWAY	HOLAND	BELGIUM	AUSTRALIA	FINLAND	N.Z.
#1 SSSW						
SW01	00000000	00000000	00000000	00000000	00000000	00000000
SW02	00000000	00000000	00000000	00000000	00000000	00000000
SW03	00000000	00000000	00000000	00000000	00000000	00000000
SW04	10000010	10000010	10000000	10000000	10000000	10000000
SW05	00000000	00000000	00000000	00000000	00000000	00000000
SW06	10000000	10000000	10000000	10000000	10000000	10000000
SW07	00000000	00000000	00000000	00000000	00000000	00000000
SW08	00000000	00000000	00000000	00000000	00000000	00000000
SW09	00000000	00000000	00000000	00000000	00000000	00000000
SW10	00000000	00000000	00000000	00000000	00000000	00000000
SW11	00000000	00000000	00000000	00000000	00000000	00000000
SW12	00000011	00000011	00000011	00000011	00000011	00000011
SW13	00000000	00000000	00000000	00000000	00000000	00000000
SW14	00000000	00000000	00000000	00000000	00000000	00000000
SW15	00000000	00000000	00000000	00000000	00000000	00000000
SW16	00000000	00000000	00000000	00000000	00000000	00000000
SW17	00000000	00000000	00000000	00000000	00000000	00000000
SW18	00000000	00000000	00000000	00000000	00000000	00000000
SW19	10011000	10011000	10011000	10011000	10011000	10011000
SW20	00000000	00000000	00000000	00000000	00000000	00000000
SW21	00000000	00000000	00000000	00000000	00000000	00000000
SW22	00000000	00000000	00000000	00000000	00000000	00000000
SW23	00000000	00000000	00000000	00000000	00000000	00000000
SW24	00000000	00000000	00000000	00000000	00000000	00000000
SW25	00000000	00000000	00000000	00000000	00000000	00000000
SW26	00000000	00000000	00000000	00000000	00000000	00000000
SW27	00000000	00000000	00000000	00000000	00000000	00000000
SW28	00000000	00000000	00000000	00000000	00000000	00000000
SW29	00000000	00000000	00000000	00000000	00000000	00000000
SW30	00000000	00000000	00000000	00000000	00000000	00000000
#2 MENU						
05:	OFF	OFF	OFF	OFF	OFF	OFF
06:	DIAL	DIAL	DIAL	DIAL	DIAL	DIAL
07:	10	10	6	10	10	13
08:	3429	3429	3429	3429	3429	3429
09:	33600bps	33600bps	33600bps	33600bps	33600bps	33600bps
10:	25Hz	25Hz	25Hz	25Hz	25Hz	25Hz
35:	DDMMYY	DDMMYY	DDMMYY	DDMMYY	DDMMYY	DDMMYY

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TYPE	ITALY	SPAIN	PORTUGAL	IRELAND	HONG KONG	MALAYSIA
#1 SSSW						
SW01	00000000	00000000	00000000	00000000	00000000	00000000
SW02	00000000	00000000	00000000	00000000	00000000	00000000
SW03	00000000	00000000	00000000	00000000	00000000	00000000
SW04	10000010	10000010	10000000	10000000	10000000	10000000
SW05	00000000	00000000	00000000	00000000	00000000	00000000
SW06	10000000	10000000	10000000	10000000	10000000	10000000
SW07	00000000	00000000	00000000	00000000	00000000	00000000
SW08	00000000	00000000	00000000	00000000	00000000	00000000
SW09	00000000	00000000	00000000	00000000	00000000	00000000
SW10	00000000	00000000	00000000	00000000	00000000	00000000
SW11	00000000	00000000	00000000	00000000	00000000	00000000
SW12	00000011	00000011	00000011	00000011	00000011	00000011
SW13	00000000	00000000	00000000	00000000	00000000	00000000
SW14	00000000	00000000	00000000	00000000	00000000	00000000
SW15	00000000	00000000	00000000	00000000	00000000	00000000
SW16	00000000	00000000	00000000	00000000	00000000	00000000
SW17	00000000	00000000	00000000	00000000	00000000	00000000
SW18	00000000	00000000	00000000	00000000	00000000	00000000
SW19	10011000	10011000	10011000	10011000	10011000	10011000
SW20	00000000	00000000	00000000	00000000	00000000	00000000
SW21	00000000	00000000	00000000	00000000	00000000	00000000
SW22	00000000	00000000	00000000	00000000	00000000	00000000
SW23	00000000	00000000	00000000	00000000	00000000	00000000
SW24	00000000	00000000	00000000	00000000	00000000	00000000
SW25	00000000	00000000	00000000	00000000	00000000	00000000
SW26	00000000	00000000	00000000	00000000	00000000	00000000
SW27	00000000	00000000	00000000	00000000	00000000	00000000
SW28	00000000	00000000	00000000	00000000	00000000	00000000
SW29	00000000	00000000	00000000	00000000	00000000	00000000
SW30	00000000	00000000	00000000	00000000	00000000	00000000
#2 MENU						
05:	OFF	OFF	OFF	OFF	OFF	OFF
06:	DIAL	DIAL	DIAL	DIAL	DIAL	DIAL
07:	6	10	6	10	10	10
08:	3429	3429	3429	3429	3429	3429
09:	33600bps	33600bps	33600bps	33600bps	33600bps	33600bps
10:	25Hz	25Hz	25Hz	25Hz	25Hz	25Hz
35:	DDMMYY	DDMMYY	DDMMYY	DDMMYY	DDMMYY	DDMMYY

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TYPE	HUNGARY	SAF	CHINA	GERMAN	FRANCE	SINGAPORE
#1 SSSW						
SW01	00000000	00000000	00000000	00000000	00000000	00000000
SW02	00000000	00000000	00000000	00000000	00000000	00000000
SW03	00000000	00000000	00000000	00000000	00000000	00000000
SW04	10000000	10000000	10000000	10000010	10000010	10000000
SW05	00000000	00000000	00000000	00000000	00000000	00000000
SW06	10000000	10000000	10000000	10000000	10000000	10000000
SW07	00000000	00000000	00000000	00000000	00000000	00000000
SW08	00000000	00000000	00000000	00000000	00000000	00000000
SW09	00000000	00000000	00000000	00000000	00000000	00000000
SW10	00000000	00000000	00000000	00000000	00000000	00000000
SW11	00000000	00000000	00000000	00000000	00000000	00000000
SW12	00000011	00000011	00000011	00000011	00000011	00000011
SW13	00000000	00000000	00000000	00000000	00000000	00000000
SW14	00000000	00000000	00000000	00000000	00000000	00000000
SW15	00000000	00000000	00000000	00000000	00000000	00000000
SW16	00000000	00000000	00000000	00000000	00000000	00000000
SW17	00000000	00000000	00000000	00000000	00000000	00000000
SW18	00000000	00000000	00000000	00000000	00000000	00000000
SW19	10011000	10011000	10011000	10011000	10011000	10011000
SW20	00000000	00000000	00000000	00000000	00000000	00000000
SW21	00000000	00000000	00000000	00000000	00000000	00000000
SW22	00000000	00000000	00000000	00000000	00000000	00000000
SW23	00000000	00000000	00000000	00000000	00000000	00000000
SW24	00000000	00000000	00000000	00000000	00000000	00000000
SW25	00000000	00000000	00000000	00000001	00000001	00000000
SW26	00000000	00000000	00000000	00000000	00000000	00000000
SW27	00000000	00000000	00000000	00000000	00000000	00000000
SW28	00000000	00000000	00000000	00000000	00000000	00000000
SW29	00000000	00000000	00000000	00000000	00000000	00000000
SW30	00000000	00000000	00000000	00000000	00000000	00000000
#2 MENU						
05:	OFF	OFF	OFF	OFF	OFF	OFF
06:	DIAL	DIAL	DIAL	DIAL	DIAL	DIAL
07:	10	10	10	8	10	10
08:	3429	3429	3429	3429	3429	3429
09:	33600bps	33600bps	33600bps	33600bps	33600bps	33600bps
10:	25Hz	25Hz	25Hz	25Hz	25Hz	25Hz
35:	YYMMDD	DDMMYY	DDMMYY	DDMMYY	DDMMYY	DDMMYY

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TYPE	CZECH	SLOVENIA	KOREA
#1 SSSW			
SW01	00000000	00000000	00000000
SW02	00000000	00000000	00000000
SW03	00000000	00000000	00000000
SW04	10000000	10000000	10000000
SW05	00000000	00000000	00000000
SW06	10000000	10000000	10000000
SW07	00000000	00000000	00000000
SW08	00000000	00000000	00000000
SW09	00000000	00000000	00000000
SW10	00000000	00000000	00000000
SW11	00000000	00000000	00000000
SW12	00000011	00000011	00000011
SW13	00000000	00000000	00000000
SW14	00000000	00000000	00000000
SW15	00000000	00000000	00000000
SW16	00000000	00000000	00000000
SW17	00000000	00000000	00000000
SW18	00000000	00000000	00000000
SW19	10011000	10011000	10011000
SW20	00000000	00000000	00000000
SW21	00000000	00000000	00000000
SW22	00000000	00000000	00000000
SW23	00000000	00000000	00000000
SW24	00000000	00000000	00000000
SW25	00000000	00000000	00000000
SW26	00000000	00000000	00000000
SW27	00000000	00000000	00000000
SW28	00000000	00000000	00000000
SW29	00000000	00000000	00000000
SW30	00000000	00000000	00000000
#2 MENU			
05:	OFF	OFF	OFF
06:	DIAL	DIAL	DIAL
07:	10	10	10
08:	3429	3429	3429
09:	33600bps	33600bps	33600bps
10:	25Hz	25Hz	25Hz
35:	DDMMYY	DDMMYY	DDMMYY

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TYPE	EUROPE	U.K.	SWEDEN	SWISS	AUSTRIA	DENMARK
#3 NUMERIC Param						
02:	10	10	10	10	10	10
03:	15	15	15	15	15	15
04:	12	12	12	12	12	12
05:	0	4	0	0	0	0
06:	0	1	0	0	0	0
09:	6	6	6	6	6	6
10:	3500	3500	6000	8500	5500	3500
15:	120	120	120	120	120	120
16:	4	2	4	2	2	4
17:	100	40	100	100	100	75
18:	0	20	0	0	0	0
19:	400	200	400	400	400	250
20:	100	40	100	100	100	100
21:	0	20	0	0	0	0
22:	400	200	400	400	400	400
23:	7	7	7	7	7	7
24:	10	10	10	10	10	10
25:	60	60	60	60	60	60
26:	5	5	5	5	5	5
#5 TYPE	EUROPE	U.K.	SWEDEN	SWISS	AUSTRIA	DENMARK

#3 No.16 through 26 and 30 are dimmed, and their settings cannot be changed.

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TYPE	NORWAY	HOLLAND	BELGIUM	AUSTRALIA	FINLAND	N.Z.
#3 NUMERIC Param						
02:	10	10	10	10	10	10
03:	15	15	15	15	15	15
04:	12	12	12	12	12	12
05:	0	0	0	0	0	0
06:	0	0	0	0	0	0
09:	6	6	6	6	6	6
10:	4600	6000	3500	3500	5500	3500
15:	120	120	120	120	120	120
16:	2	4	2	4	4	2
17:	30	100	100	100	100	40
18:	30	0	0	0	0	20
19:	400	400	300	400	400	200
20:	30	100	100	100	100	40
21:	30	0	0	0	0	20
22:	400	400	300	400	400	200
23:	7	7	7	7	7	7
24:	10	10	10	10	12	10
25:	60	60	60	60	60	60
26:	5	5	5	5	5	5

#5 TYPE	NORWAY	HOLLAND	BELGIUM	AUSTRALIA	FINLAND	N.Z.

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TYPE	ITALY	SPAIN	PORTUGAL	IRELAND	HONG KONG	MALAYSIA
#3 NUMERIC Param						
02:	10	10	10	10	10	10
03:	15	15	15	15	15	15
04:	12	12	12	12	12	12
05:	0	15	0	0	4	0
06:	0	3	0	0	1	0
09:	6	6	6	6	6	6
10:	5500	3500	3500	3500	3500	3500
15:	120	120	120	120	120	120
16:	2	4	4	4	4	4
17:	30	150	40	40	40	100
18:	30	0	20	20	20	0
19:	400	300	200	200	200	400
20:	30	150	40	40	40	100
21:	30	0	20	20	20	0
22:	400	300	200	200	200	400
23:	7	7	7	7	7	7
24:	10	10	10	10	10	10
25:	60	60	60	60	60	60
26:	5	5	5	5	5	5
#5 TYPE	ITALY	SPAIN	PORTUGAL	IRELAND	HONG KONG	MALAYSIA

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TYPE	HUNGARY	SAF	CHINA	GERMAN	FRANCE	SINGAPORE
#3 NUMERIC Param						
02:	10	10	10	10	10	10
03:	15	15	15	15	15	15
04:	12	12	12	6	12	12
05:	0	0	0	0	0	0
06:	0	0	0	0	0	0
09:	6	6	6	6	6	6
10:	3500	3500	3500	6000	14000	3500
15:	120	120	120	120	120	120
16:	4	4	4	4	2	4
17:	100	40	100	40	30	100
18:	0	20	0	20	30	0
19:	400	200	400	200	400	400
20:	100	40	100	100	150	100
21:	0	20	0	0	0	0
22:	400	200	400	200	300	400
23:	7	7	7	9	7	7
24:	10	10	10	10	10	10
25:	60	60	60	60	60	60
26:	5	5	5	5	5	5
#5 TYPE	HUNGARY	SAF	CHINA	GERMAN	FRANCE	SINGAPORE

TYPE	CZECH	SLOVENIA	KOREA
#3 NUMERIC Param			
02:	10	10	10
03:	15	15	15
04:	12	12	12
05:	0	0	0
06:	0	0	0
09:	6	6	6
10:	5500	5500	3500
15:	120	120	120
16:	4	4	4
17:	100	100	40
18:	0	0	20
19:	400	400	200
20:	100	100	40
21:	0	0	20
22:	400	400	200
23:	7	7	6
24:	10	10	10
25:	60	60	60
26:	5	5	3
#5 TYPE	CZECH	SLOVENIA	KOREA

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#7 PRINTER

The following settings are used in common in all countries.

1. Bit SW

TYPE	
#7 PRINTER	
SW01	00000000
SW02	00000000
SW03	00000000
SW04	00000000
SW05	10000000
SW06	00000010
SW07	00000000
SW08	00000000
SW09	00000000
SW10	00000000
SW11	00000000
SW12	00000000
SW13	00000000
SW14	00000000
SW15	00000000
SW16	00000000
SW17	00000000
SW18	00000000
SW19	00000000
SW20	00000000

2. Parameter

TYPE	
01:	12
02:	0
03:	0
04:	3
05:	3
06:	0
07:	0
08:	0
09:	0
10:	0
11:	0
12:	0
13:	0
14:	0
15:	0
16:	0
17:	0
18:	0
19:	0
20:	0
21:	0
22:	0
23:	0
24:	0
25:	0
26:	0
27:	0
28:	0
29:	0
30:	0

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CHAPTER 5

ERROR CODE

I. USER ERROR CODES 5-1

II. SERVICE ERROR CODES 5-5

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I. USER ERROR CODE

#001 (transmission) original jam	
Cause	Action
• An original is trapped.	• Remove the original, and start over.
• The size/thickness of the original is out of spec.	1. Make a copy in book mode, and send; or, send in book mode. 2. If the original is thin, send in book mode.
• A fault exists in the internal mechanism.	See the descriptions under "Detecting Original Jams" in the RDF-G1 Service Manual.

#003 (transmission/reception) 1 page copying, transmission/reception time-over	
Cause	Action
• A single page is 1 m or more or copying/transmission takes more than a specific time length (32 min).	1. Make a copy in book mode, and copy/send by dividing the original. 2. Using bit 0 and bit 1 of SW12 in #1 SSSW, increase the setting of the page timer.
• Reception takes more than a specific time length (32 min).	1. Request the other party to send the original by dividing it. 2. Contact the other party to find out the causes.
• A fault exists in the internal mechanism.	3. Using bit 0 and bit 1 of SW12 in #1 SSSW, increase the setting of the page timer. See the descriptions under "Detecting Original Jams" in the RDF-G1 Service Manual.

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#005 (transmission/reception) initial identification (T0/T1) time-over	
Cause	Action
• The tone/pulse setting is wrong.	• Set the tone/pause settings correctly.
• The time that passes before a connection to the other party is made is too long.	1. Put a longer pause when setting auto dial so as to delay the start of the timer. 2. Put a delay to the T1 timer using 10 of #3 NUMERIC Param. so as to avoid time-over.
• The other device does not respond.	• Contact the other party to find out the cause.
• The acknowledgment signal cannot be detected after transmission of the DIS signal.	• Put a delay to the T1 timer (reception) using 11 of #3 NUMERIC Param. so as to avoid time-over.
• The communication mode of the other device does not mach.	• Each model may use a different communication mode.
• The second ring does not arrive for transmission to F Net.	
1. During transmission, the other device malfunctions because of an echo. 2. During reception, the device malfunctions because of an echo.	

#009 (reception) recording paper jam/absence of recording paper	
Cause	Remedy
• Recording paper jammed.	• Remove the jam.
• Recording paper has run out.	• Set recording paper.
• A fault exists in the internal mechanism.	1. Check the actuator of the upper cassette delivery sensor (Q1604)/lower cassette delivery sensor (Q1605) for damage and deformation. 2. Provide measures against feeding problems described in the Service Manual of the host copier. 3. Replace the pick-up unit circuit. 4. Replace the DC controller PCB.

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#011 (reception) polling reception error	
Cause	Action
• No original exists in the other device.	• Request the other party to set the original properly.
• The original is not set properly at time of transmission, initiating polling reception.	• Set the original properly for transmission.

#012 (transmission) no recording paper in the other device	
Cause	Action
• No recording paper exists in the other device.	• Request the other party to set recording paper.

#018 (transmission/reception) auto ring error	
Cause	Action
• The tone/pulse settings are wrong.	• Set the tone/pulse settings correctly.
• The time length of line connection is too long.	1. Put a longer pause when setting auto dial, thereby delaying the start of the timer. 2. Put a delay to the T1 timer using 10 of #3 NUMERIC Param., thereby preventing a time-over.
• The other device was busy, causing a time-over.	• Try ringing again.
• The other device is not connected or is turned off, causing a time-over.	• Contact the other party to find out the cause.
• No recording paper exists in the other device, causing a time-over.	• Request the other party to set recording paper.
• The No. 2 ring does not arrive for transmission to F Net.	• Find out if subscription to F Net has been made, and report a line fault to the telephone company.

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#022 (transmission) ringing failure	
Cause	Action
• For broadcasting or multiple polling reception, the telephone number of the other device is not registered in the auto dial directory.	• Register the telephone number of the other party.

#037 (reception) image memory full during reception	
Cause	Remedy
• The amount of data is too large in reception.	• Delete unnecessary image data, and request for re-transmission.

#995 (transmission) memory transmission reservation canceled	
Cause	Remedy
• The user canceled the memory transmission reservation.	• Try re-transmission.

Caution:

If the communication memory lamp on the control panel is flashing, suspect that the handset (accessory) is in off-hook condition while the LINE modular jack is not fully inserted.
To correct the problem, check the connection of the LINE modular jack, and put the handset into off-hook condition.

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II. SERVICE ERROR CODES

- G3 Mode Error code

##100 (transmission) excess re-transmissions of procedure signal during transmission	
Cause	Remedy
• If after transmission of Q following image data, The line condition is poor, and the other device cannot receive image data or the Q signal properly.	• Increase the transmission level of the modem using parameter 07 of #MENU so that the other device may receive image data or Q properly. 2. Lower "transmission speed" under "system control" in user mode. 3. Adjust the NL equalizer using parameter 05 of #2 MENU so that the other device may receive image data or Q properly. 4. Add an echo protect tone to the V.29 modem signal using bit 1 of SW03 in #1 SSSW.
• If after transmission of TCF preceding image data, The level of transmission is low, and the other device cannot receive the signals properly.	• If after transmission of TCF preceding image data, Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive the signals properly.
• If after transmission of TCF preceding image data, The other device malfunctioned because of an echo.	• If after transmission of TCF preceding image data, 1. Provide measures by referring to the descriptions for S#1 SSSW SW03. 2. Put a longer pause to the telephone number when registering for auto dial so as to avoid response to the first DIS from the other device. 3. Press the Start key only after hearing the first DIS from the other device in manual ringing.

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##101 (transmission/reception) mismatch of modem speeds	
Cause	Remedy
• During transmission The other device uses a different modem speed.	• During transmission, Different modems may use different speeds, eliminating remedies.
• During transmission The speeds fail to match when a fall-back occurs.	• During transmission, 1. Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive TCF properly. 2. Adjust the NL equalizer using parameter 05 of #2 MENU so that the other device may receive TCF properly. 3. Put a longer pause at the end of the telephone number when registering for auto dial so as to avoid responding to the first DIS from the other device. 4. Press the Start key only after hearing the first DIS from the other device.
• During reception The other party uses a different modem speed.	• During reception, Each different modem uses a different speed, eliminating remedies.

##102 (transmission) fault-back fails during transmission	
Cause	Remedy
• The line has poor condition, preventing proper transmission of TCF.	1. Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive TCF properly. 2. Adjust the NL equalizer using parameter 05 of #2 MENU so that the other device may receive TCF properly.
• The other device malfunctioned because of an echo.	1. Provide measures against echoes by referring to the descriptions for #1 SSSW SW03. 2. Put a longer pause to the end of the telephone number when registering for auto dial so as to prevent responding to the first DIS. 3. Press the Start key only after hearing the first DIS from the other device in manual ringing. 4. Request the other party to lower the transmission level so as not to receive an echo.

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##103 (reception) EOL not detected for 5 sec during reception	
Cause	Remedy
• The line condition is poor, and the image signal cannot be received properly.	1. Raise the transmission level of the modem using parameter 07 of #2 MENU to ensure proper reception of image signals. 2. Request the other party to lower the transmission start speed. 3. Adjust the NL equalizer using parameter 05 of #2 MENU so as to ensure proper reception of image signals.
• An echo of CFR caused malfunction.	1. Provide measures against echoes by referring to the descriptions under #1SSSW SW03. 2. Lower the transmission level of the modem using parameter 07 of #2 MENU so as to prevent reception of echoes of CFR.

##104 (transmission) RTN or PIN received during transmission	
Cause	Remedy
• The condition of the line is poor, and the other party cannot receive image signals properly.	1. Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device can receive image signals properly. 2. Lower "transmission start speed" under "system control" in user mode. 3. Attach an echo protect tone to the V.29 modem signal using bit 1 of SW03 under #1 SSSW. 4. Request the other party to relax the RTN transmission conditions so that the other device will not transmit RTN. 5. Adjust the NL equalizer using parameter 05 of #2 MENU so that the other device may receive image signals properly.
• The other device malfunctioned as a result of echoes.	1. Provide measures against echoes by referring to the descriptions under #1 SSSW SW03. 2. Add a longer pause at the end of the telephone number when registering for auto dial so as to prevent responding to the first DIS from the other device. 3. Press the Start key after hearing the first DIS from the other device in manual ringing. 4. Request the other party to lower the transmission level of the other device so that the other device will not receive echoes.

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##106 (reception) procedure signal not received for 6 sec during reception	
Cause	Remedy
• The condition of the line is poor, and the procedure signal from the other party cannot be received properly.	• Request the other party to raise the transmission level of the other device to ensure correct reception of the procedure signal.
• The condition of the line is poor, and the other device cannot receive image signals properly.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive signals properly.
• An echo caused malfunction.	1. Provide measures against echoes by referring to the descriptions under #1 SSSW SW03. 2. Lower the transmission level of the modem using parameter 07 of #2 MENU so as to prevent reception of echoes of transmitted CFR.

##107 (reception) fall-back not possible on transmitting device during reception	
Cause	Remedy
• The condition of the line is poor, and the signals from the other device cannot be received properly after starting 2400 bit/sec reception mode.	1. Request the other party to raise the transmission level of the other device so as to ensure correct reception of signals from the other device. 2. Adjust the NL equalizer using parameter 05 of #2 MENU so that the other device may receive TCF properly. 3. Relax the RTN transmission conditions using 02 through 04 of #3 NUMERIC Pram. so as to prevent transmission of RTN.
• An echo caused malfunction.	1. Provide measures against echoes by referring to the descriptions under #1 SSSW SW03. 2. Lower the transmission level of the modem using parameter 07 of #2 MENU.

##109 (transmission) non-DIS, -DTC, -FIT, -CFR, -CRP received after transmission of DCS during transmission, causing excess procedure signal re-transmission	
Cause	Remedy
• An error occurred in the procedure signal.	• Make a recording of the exchange procedure sound on DAT and request the technology center for analysis.

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##111 (transmission/reception) memory error	
Cause	Remedy
• An error occurred when printing data stored in the image memory because of noise.	• Print out all data, and execute all-clear; then, store the data once again.
• Noise can cause dialing of wrong numbers. (The pointer of the telephone number used for printing/display does not match the pointer used for ringing.)	• Replace the fax PCB.

##114 (reception) RTN transmitted during reception	
Cause	Remedy
• The condition of the line is poor, and image signals from the other device cannot be received properly.	1. Request the other device to raise the transmission level so as to ensure correct reception of image signals. 2. Request the other party to lower the transmission start speed of the other device. 3. Adjust the NL equalizer using parameter 05 of #2 MENU so as to ensure correct reception of image signals. 4. Relax the RTN transmission conditions using 02 through 04 of #3 NUMERIC Param. so as to prevent transmission of RTN.
• An echo of CFR caused malfunction.	1. Provide measures against echoes by referring to the descriptions under #1 SSSW SW03. 2. Lower the transmission level of the modem using parameter 07 of #2 MENU so as to prevent reception of echoes of transmitted CFR.

##200 (reception) carrier not detected for 5 sec while receiving image data during reception	
Cause	Remedy
• The condition of the line is poor, and image signals cannot be received properly.	1. Request the other party to raise the transmission level of the other device so as to ensure correct reception of signals from the other device. 2. Request the other party to lower the transmission start speed of the other device.
• An echo of CFR prevented reception of training signals, causing a time-over.	1. Provide measures against echoes by referring to the descriptions under #1 SSSW SW03. 2. Lower the transmission level of the modem using parameter 07 of #2 MENU so as to prevent reception of echoes of transmitted CFR.

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##201 (transmission/reception) DCN received outside normal binary procedure	
Cause	Remedy
• The other party is not ready to receive data. (no recording paper)	• Request the other party to make the other device ready for reception. (by setting recording paper)
• The user TEL has not been registered (the other device is RICHO 3000L).	• Register an appropriate user TEL.
• The password does not match for polling reception.	• If the other device is of the same model, contact the other party to match the passwords. If the other device is a non-Canon device, contact the other party to set the device for polling transmission.
• No original is set for transmission.	• Set an original, and request the other party to ring once again.
• Reception was attempted, but recording paper does not exist.	• Set recording paper.
• The condition of the line is poor, and the other device cannot receive procedure signals properly.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive the procedure signals properly.
• An echo caused malfunction.	1. Provide measures against echoes by referring to the descriptions under #1 SSSW SW03. 2. Lower the transmission level of the mode using parameter 07 of #2 MENU so as to prevent reception of echoes.
• Image signals or Q signal cannot be received, and the other (transmitting) device suffered an excess procedure signal re-transmission.	1. Request the other party to raise the transmission level of the other device so as to enable correct reception of signals. 2. Adjust the NL equalizer using parameter 05 of #2 MENU so as to enable correct reception of signals. 3. Request the other party to lower the transmission start speed of the other device.
• The condition of the line is poor, and the other device cannot use a fall-back.	1. Relax the RTN transmission condition using 02 through 04 of #3 NUMERIC Param. so as to prevent transmission of RTN. 2. Adjust the NL equalizer using parameter 05 of #2 MENU so as to ensure correct reception of signals.

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##220 (transmission/reception) system error (main program out of control)	
Cause	Remedy
• Noise caused the CPU to operate.	• Turn off and then on the power.

##224 (transmission/reception) error in procedure signal in G3 mode	
Cause	Remedy
• An error occurred in the procedure signal.	• Make a recording of the communication procedure sound on DAT, and have it analyzed.

##232 (transmission) malfunction of fax PCB	
Cause	Remedy
• The operation of the UPI used to control ENCODE failed to end normally.	• Replace the fax PCB.

##237 (reception) fax PC malfunction	
Cause	Remedy
• The UPI used to control DECODE did not end normally.	• Replace the fax PCB.

##238 (reception) PRINT control unit malfunction	
Cause	Remedy
• The UPI used to control PRINT did not end normally.	• Replace the fax PCB.

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##261 (transmission/reception) system error between modem and gate array	
Cause	Remedy
• A fault exists in the internal unit (when RS is set to 1, CS fails to turn 1).	• Replace the fax PCB (faulty modem).

##280 (transmission) excess procedure re-transmission during transmission	
Cause	Remedy
• The transmission level is too low and, after transmission of TCF, the other device cannot receive signals properly.	• Raise the transmission level of the modem using parameter 07 of #2 MENU.
• The other device caused the other party to malfunction.	1. Provide measures against echoes by referring to the descriptions under #1 SSSW SW03. 2. Add a longer pause at the end of the telephone line when registering for auto dial so as to prevent responding to the first DIS from the other device. 3. Press the Start key after hearing the first DIS from the other device in manual ringing. 4. Request the other party to lower the transmission level of the other device so that the other party will not receive echoes.

##281 (transmission) excess procedure signal re-transmission during transmission	
Cause	Remedy
• The condition of the line is poor, and image signals or EOP is not transmitted properly, preventing correct reception of signals after transmission of EOP.	1. Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive image signals or EOP properly. 2. Lower "transmission start speed" of "system control" in user mode. 3. Adjust the NL equalizer using parameter 05 of #2MENU so that the other device may receive image signals properly. 4. Attach an echo protect tone to the V.29 modem signal using bit 1 of SW03 of #1 SSSW.

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##285 (transmission) DCN received after transmission of EOP during transmission	
Cause	Remedy
• The Stop key was pressed during communication.	• Try re-transmission.

##286 (transmission) DCN received after transmission of EOM during transmission	
Cause	Remedy
• The Stop key was pressed during communication.	• Try re-transmission.

##287 (transmission) DCN received after transmission of MPS during transmission	
Cause	Remedy
• The Stop key was pressed during communication.	• Try re-transmission.

##288 (transmission) non-PIN, -PIP, -MCF, -RTP, -RTN signal received after transmission of EOP during transmission	
Cause	Remedy
• An error occurred in the procedure signal.	• Make a recording of the communication procedure sound on DAT, and have it analyzed.

##289 (transmission) non-PIN, -PIP, -MCF, -RTP, -RTN signal received after transmission of EOM during transmission	
Cause	Remedy
• An error occurred in the procedure signal.	• Make a recording of the communication procedure sound on DAT, and have it analyzed.

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##290 (transmission) non-PIN, -PIN, -MCF, -RTP, -RTN signal received after transmission of MPS during transmission	
Cause	Remedy
• An error occurred in the procedure signal.	• Make a recording of the communication procedure sound on DAT, and have it analyzed.

##671 (reception) line released by T1 time-out (procedure fails to move to 2 after detection of CM signal of caller during V.8	
Cause	Remedy
• The line of the caller broke in phase 1, or signals of the caller cannot be detected.	• Prohibit the V.8/V.34 procedure of the caller using bit 1 of SW28 of #1 SSSW. • Adjust the transmission level to between 0 and -15 dBm.

##672 (transmission) line released by T1 time-out (procedure fails to move to phase 3 from phase 2 during V.34 transmission)	
Cause	Remedy
• The line of the receiving device broke in phase 2, and signals of the receiving device cannot be received.	• Prohibit V.8/V.34 procedure of the caller using bit 0 of SW28 of #1 SSSW. • Adjust the transmission level to between 0 and -15 dBm.

##673 (reception) line released by T1 time-out (procedure fails to move to phase 3 from phase 2 in V.34 reception)	
Cause	Remedy
• The line of the transmitting device broke in phase 2, or signals of the transmitting device cannot be detected.	• Prohibit V.8/V.34 procedure using bit 1 of SW28 of #1 SSSW. • Adjust the transmission level to between 0 and 15 dBm.

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##674 (transmission) line released by T1 time-out (procedure fails to move to control channel onward from phase 3 or phase 4 during V.34 transmission)	
Cause	Remedy
• The line of the receiving device broke in phase 3 or phase 4, or signals of the receiving device cannot be detected.	• Prohibit the V.8/V.34 procedure of the caller using bit 0 of SW28 of #1 SSSW. Adjust the transmission level to between 0 and -15 dBm.

##675 (reception) line released by T1 time-out (procedure fails to move to control channel onward from phase 3 or phase 4 during V.34 reception)	
Cause	Remedy
• The line of the transmitting device broke in phase 3 or phase 4, of signals of the transmitting device cannot be detected.	• Prohibit the V.8/V.34 procedure of the callee using bit 1 of SW28 of #1 SSSW. Adjust the transmission level to between 0 and -15 dBm.

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##750 (transmission) excess procedure signal re-transmission (failure to receive acknowledge signal after transmission of PPS-NULL)	
Cause	Remedy
• The condition of the line is poor, and PPS-NULL cannot be transmitted properly.	1. Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive PPS-NULL properly. 2. Adjust the NL equalizer using parameter 05 of #2 MENU so that the other device may receive PPS-NULL properly. 3. Add an echo protect tone to the V.29 modem signal using bit 1 of SW03 of #1 SSSW.
• The condition of the line is poor, and signals cannot be received properly.	• Request the other party to raise the transmission level of the other device to ensure correct reception of signals.

##752 (transmission) DCN received after transmission of PPS-NULL	
Cause	Remedy
• The condition of the line is poor, and the other device cannot receive PPS-NULL properly.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive PPS-NULL properly.
• The Stop key was pressed during communication.	• Try re-transmission.

##753 (transmission) excess procedure signal re-transmission or T5 time-over (60 sec) after transmissions of PPS-NULL	
Cause	Remedy
• The page buffer of the other device is full or is in use so that an acknowledge signal cannot be received properly after transmission of RR in response to RNR after transmission of PPS-NULL.	1. Turn the setting of 'CUSTOM FAX SETTINGS > TX SETTINGS > ECM TX' to 'OFF'. 2. Lower the setting of 'CUSTOM FAX SETTINGS > SYSTEM SETTINGS > TX START SPEED'.

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##754 (transmission) excess procedure signal re-transmission after transmission of PPS-NULL	
Cause	Remedy
• The condition of the line is poor and, although PPR has been received four times after transmission of PPS-NULL and then CTC has been transmitted, the other device cannot receive it properly.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive CTC properly.
• The condition of the line is poor and, although PPR has been received four times after transmission of PPS-NULL and CTC has been transmitted, the acknowledge signal cannot be received properly.	• Request the other party to raise the transmission level of the other device.

##755 (transmission) excess procedure signal re-transmission after transmission of PPS-MPS (acknowledge signal not received)	
Cause	Remedy
• The condition of the line is poor, and PPS-MPS is not transmitted properly.	1. Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive PPS-MPS properly. 2. Adjust the NL equalizer using parameter 05 of #2 MENU so that the other device may receive PPS-MPS properly. 3. Add an echo protect tone to the V.29 modem using bit 1 of SW03 of #1 SSSW.
• The condition of the line is poor, and signals cannot be received properly.	• Request the other party to raise the level of the other device to ensure correct reception of signals.

##757 (transmission) DCN received after transmission of PPS-MPS	
Cause	Remedy
• The condition of the line is poor, and the other party cannot receive PPS-MPS properly.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other party may receive PPS-MPS properly.
• The Stop key was pressed during communication.	• Try re-transmission.

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##758 (transmission) excess procedure signal re-transmission or T5 time-over (60 sec) after transmission of PPS-MPS	
Cause	Remedy
• The page buffer of the other device is full or is in use and, although RNR has been received after transmission of PPS-MPS, an acknowledge signal cannot be received properly after transmission of RR.	1. Turn the setting of 'CUSTOM FAX SETTINGS > TX SETTINGS > ECM TX' to 'OFF'. 2. Lower the setting of 'CUSTOM FAX SETTINGS > SYSTEM SETTINGS > TX START SPEED'.

##759 (transmission) excess procedure signal re-transmission after transmission of PPS-MPS	
Cause	Remedy
• The condition of the line is poor and, Although PPR has been received four times after transmission of PPS-MPS and CTC has been transmitted, the other party cannot receive the signal properly.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive CTC properly.
• The condition of the line is poor and, although PPR has been received four times after transmission of PPS-MPS, an acknowledge signal cannot be received after transmission of CTC.	• Ask the transmission level of the other device to ensure correct reception of signals.

##760 (transmission) excess procedure signal re-transmission after transmission of PPS-EOM (acknowledge signal not received)	
Cause	Remedy
• The condition of the line is poor, and the other device cannot receive PPS-EOM properly.	1. Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive PPS-EOM properly. 2. Adjust the NL equalizer using parameter 05 of #2 MENU so that the other device may receive PPS-EOM properly. 3. Attach an echo protect tone to the V.29 modem signal using bit 1 of SW03 of #1 SSSW.
• The condition of the line is poor, and signals cannot be received properly.	• Request the other party to raise the transmission level of the other device.

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##762 (transmission) DCN received after transmission of PPS-EOM	
Cause	Remedy
• The condition of the line is poor, and the other device cannot receive PPS-EOM properly.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other party may receive PPS-EOM properly.
• The Stop key was pressed during communication.	• Try re-transmission.

##763 (transmission) excess procedure signal re-transmission or T5 time-over (60 sec) after transmission of PPS-EOM	
Cause	Remedy
• The page buffer of the other device is full or is in use and, although RNR has been received after transmission of PPS-EOM, an acknowledge signal cannot be received after transmission of RR.	1. Turn the setting of 'CUSTOM FAX SETTINGS > TX SETTINGS > ECM TX' to 'OFF'. 2. Lower the setting of 'CUSTOM FAX SETTINGS > SYSTEM SETTINGS > TX START SPEED'.

##764 (transmission) excess procedure signal re-transmission after transmission of PPS-EOM	
Cause	Remedy
• The condition of the line is poor and, although PPR has been received four times after transmission of PPS-EOM and CTC has been transmitted, the other device cannot receive the signals properly.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other devicemay receive CTC properly.
• The condition of the line is poor and, although CTC has been transmitted after receiving PPR four times and transmission of PPS-EOM has been transmitted, an acknowledge signal cannot be received properly.	• Request the other party to raise the transmission level of the other device to ensure correct reception of signals.

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##765 (transmission) excess procedure signal re-transmission after transmission of PPS-EOP (acknowledge signal not received)	
Cause	Remedy
• The condition of the line is poor, and the other device cannot receive PPS-EOP properly.	1. Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive PPS-EOP properly. 2. Adjust the NL equalizer using parameter 05 of #2MENU so that the other device may receive PPS-EOP properly. 3. Attach an echo protect tone to the V.29 modem signal using bit 1 of SW03 of #1 SSSW.
• The condition of the line is poor, and signals cannot be received properly.	• Request the other party to raise the transmission level of the other device to ensure correct reception signals.

##767 (transmission) DCN received after transmission of PPS-EOP	
Cause	Remedy
• The condition of the line is poor, and the other device cannot receive PPS-EOP properly.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive PPS-EOP properly.
• The Stop key was pressed during communication.	• Try re-transmission.

##768 (transmission) excess procedure signal re-transmission or T5 time-over (60 sec) after transmission of PPS-EOP	
Cause	Remedy
• The page buffer of the other device is full or is in use and, although RNR has been received after transmission of PPS-EOP, an acknowledge signal cannot be received after transmission of RR.	1. Turn the setting of 'CUSTOM FAX SETTINGS > TX SETTINGS > ECM TX' to 'OFF'. 2. Lower the setting of 'CUSTOM FAX SETTINGS > SYSTEM SETTINGS > TX START SPEED'.

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##769 (transmission) excess procedure signal re-transmission after transmission of PPS-EOP	
Cause	Remedy
• The condition of the line is poor and, although CTC has been transmitted after receiving PPR four items after transmission of PPS-EOP, the other device cannot receive the signal.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive CTC properly.
• The condition of the line is poor and, although PPR has been received four times after transmission of PPS-EOP, an acknowledge signal cannot be received properly after transmission of CTC.	• Request the other party to raise the transmission level of the other device.

##770 (transmission) excess procedure signal re-transmission after transmission of EOR-NULL (acknowledge signal not received)	
Cause	Remedy
• The condition of the line is poor, and the other device cannot receive EOR-NULL properly.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other party may receive EOR-NULL.
• The condition of the line is poor, and signals cannot be received properly.	• Request the other party to raise the transmission level of the other device to ensure correct reception of signals.

##772 (transmission) DCN received after transmission of EOR-NULL	
Cause	Remedy
• The condition of the line is poor, and the other device cannot receive EOR-NULL properly. • The condition of the line is poor, and signals cannot be received properly.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive EOR-NULL properly.

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##780 (transmission) excess procedure signal re-transmission after transmission of EOR-EOM (acknowledge signal not received)	
Cause	Remedy
• The condition of the line is poor, and the other device cannot receive EOR-EOM. • The condition of the line is poor, and signals cannot be received.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive EOR-EOM properly. • Request the other party to raise the transmission level of the other device to ensure correct reception of EOR-EOM. • Try re-transmission.

##782 (transmission) DCN reception after transmission of EOR-EOM	
Cause	Remedy
• The line condition is poor, and the other device cannot receive EOR-EOM correctly.	• Raise the transmission level of the modem using parameter 07 of #2MENU to ensure proper reception of EOP-EOM by the other device.
• The Stop button is pressed during communication.	• Try re-transmission.

##783 (transmission) excess procedure signal re-transmission or T5 time-over (60 sec) after transmission of PPS-EOM	
Cause	Remedy
• The page buffer of the other device is full or is in use and, although RNR has been received after transmission of PPS-EOM, an acknowledge signal cannot be received after transmission of RR.	1. Turn the setting of 'CUSTOM FAX SETTINGS > TX SETTINGS > ECM TX' to 'OFF'. 2. Lower the setting of 'CUSTOM FAX SETTINGS > SYSTEM SETTINGS > TX START SPEED'.

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##784 (transmission) ERR received after transmission of EOR-EOM	
Cause	Remedy
• The condition of the line is poor, and the other device cannot receive image signals often.	1. Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive image signals properly. 2. Adjust the NL equalizer using parameter 05 of #2 MENU so that the other device may receive image signals properly.
• The other device malfunctioned because of an echo.	1. Provide measures against echoes by referring to 31 SSSW SW03. 2. Add a longer pause to the end of the telephone number when registering under auto dial to prevent responding to the first DIS from the other device. 3. Press the Start key after hearing the first DIS from the other device in manual ringing. 4. Request the other party to lower the transmission level of the other device so that the other device will not receive echoes.

##785 (transmission) excess procedure signal re-transmission after transmission of EOR-EOP (acknowledge signal not received)	
Cause	Remedy
• The line condition is poor, and the other device cannot receive EOR-EOM correctly.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive EOR-EOP properly.
• The Stop button is pressed during communication.	• Request the other party to raise the level of the other device so that signals may be received properly.

##787 (transmission) DCN received after transmission of ERO-EOP	
Cause	Remedy
• The condition of the line is poor, and the other device cannot receive EOR-EOP properly.	• Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive EOR-EOP properly.
• The Stop key was pressed during communication.	• Try re-transmission.

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##788 (transmission) excess procedure signal re-transmission or T5 time-over (60 sec) after transmission of EOR-EOP	
Cause	Remedy
• The page buffer of the other device is full or is in use and, although RNR has been received after transmission of EOR-EOP, an acknowledge signal cannot be received after transmission of RR.	1. Turn the setting of 'CUSTOM FAX SETTINGS > TX SETTINGS > ECM TX' to 'OFF'. 2. Lower the setting of 'CUSTOM FAX SETTINGS > SYSTEM SETTINGS > TX START SPEED'.

##789 (transmission) ERR received after transmission of EOR-EOP	
Cause	Remedy
• The condition of the line is poor, and the other device cannot receive image signals often.	1. Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive image signals properly. 2. Adjust the NL equalizer using parameter 05 of #2 MENU so that the other device may receive image signals properly.
• The other device malfunctioned because of an echo.	1. Provide measures against echoes by referring to the descriptions under #1 SSSW SW03. 2. Attach a longer pause at the end of the telephone number when registering under auto dial to prevent responding to the first DIS from the other device. 3. Press the Start key after hearing the first DIS from the other device in manual ringing. 4. Request the other party to lower the transmission level of the other device so that the other device will not receive echoes.

##790 (reception) ERR transmitted after reception of EOR-Q	
Cause	Remedy
• The condition of the line is poor, and the other device often cannot receive image signals properly.	1. Request the other party to raise the transmission level of the modem of the other device so as to ensure correct reception of image signals. 2. Adjust the NL equalizer using parameter 05 of #2 MENU to ensure correct reception of image signals.
• The other device malfunctioned because of an echo.	• Provide measures against echoes by referring to the descriptions under #1 SSSW SW03.

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##793 (reception) time-over by failure to detect effective frame during reception of high-speed signals	
Cause	Remedy
• The condition of the line is poor, and the other device cannot receive signals properly.	1. Raise the transmission level of the modem using parameter 07 of #2 MENU so that the other device may receive signals properly. 2. Adjust the NL equalizer using parameter 05 of #2 MENU so that the other device may receive signals properly.
• The condition of the line is poor, and signals cannot be received properly.	1. Request the other party to lower the start speed of the other device. 2. Request the other party to raise the transmission level of the other device to ensure correct reception of signals.
• The communications coding was busy.	1. Turn off and then on the power. 2. Replace the fax PCB.

##795 (transmission/reception) error in decoding for communication	
Cause	Remedy
• The communications coding was busy.	1. Turn off and then on the power. 2. Replace the fax PCB.

##799 (transmission) system error	
Cause	Remedy
• EOR was about to be transmitted in an abbreviated procedures.	1. Turn off and then on the power. 2. Replace the fax PCB.

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APPENDIX

A. GENERAL CIRCUIT DIAGRAM A-1
B. NCU CIRCUIT DIAGRAM A-3
C. SYSTEM MOTHER CIRCUIT DIAGRAM A-5
D. MODULAR UNIT CIRCUIT DIAGRAM A-7

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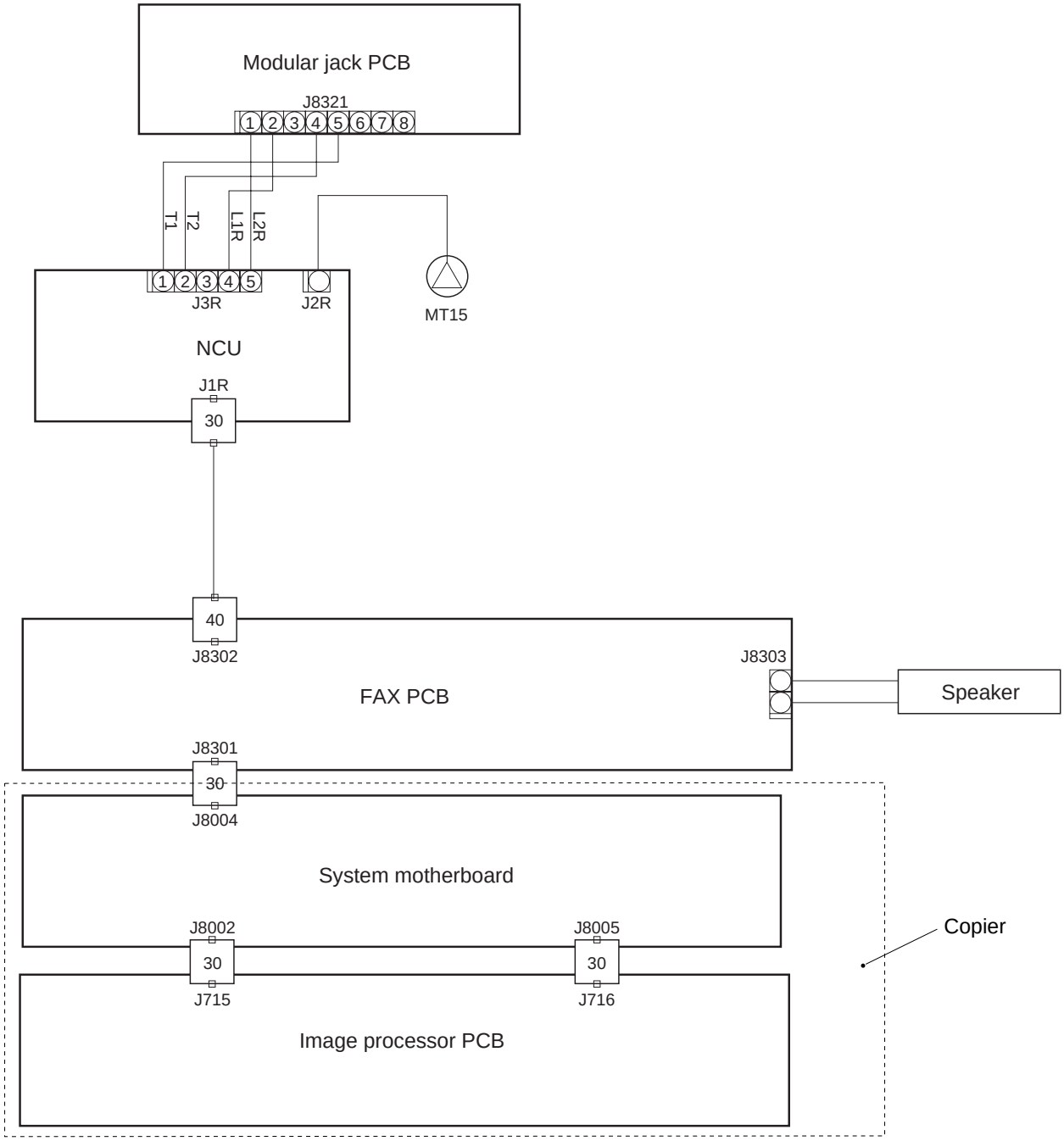
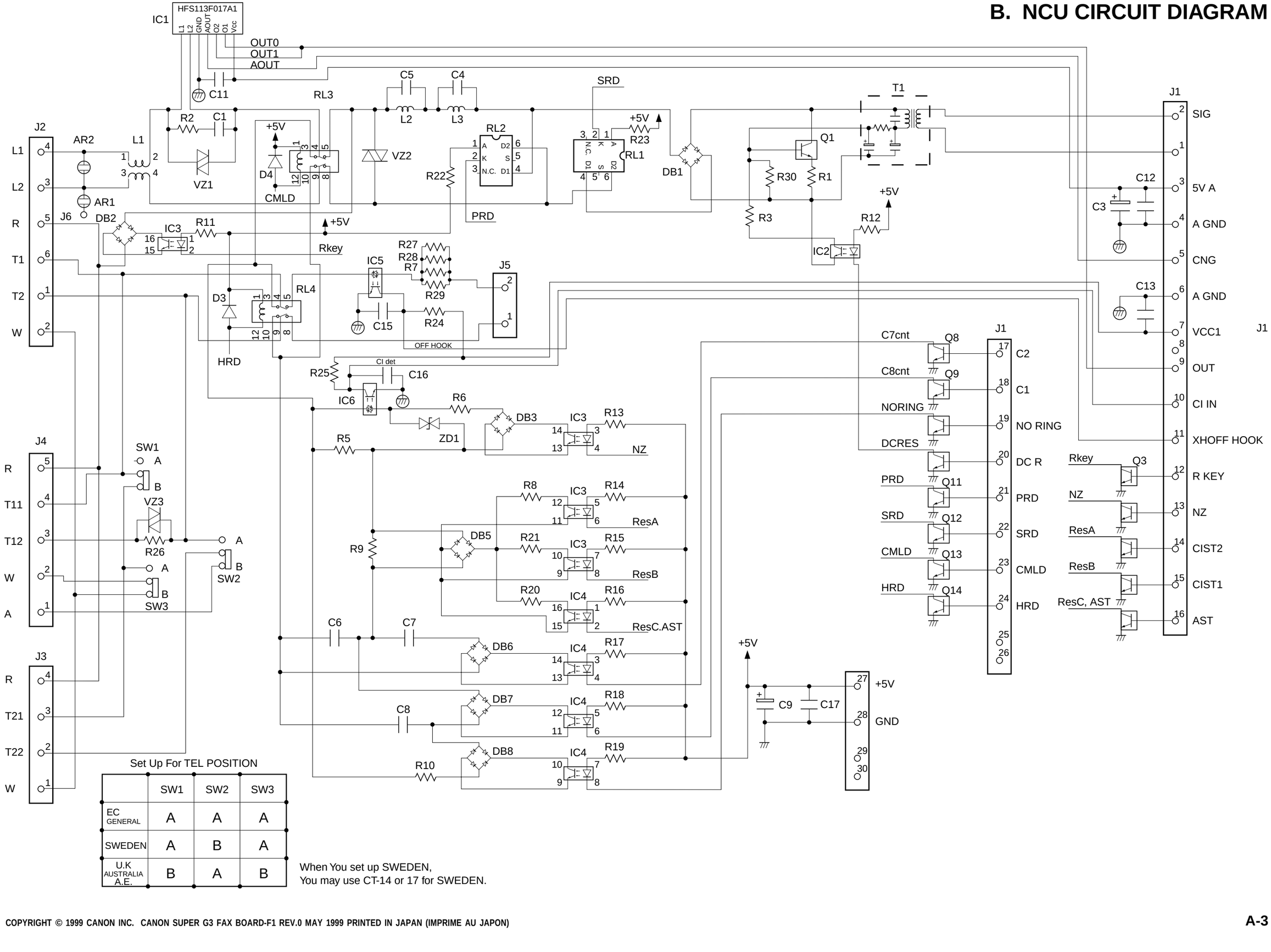
A. GENERAL CIRCUIT DIAGRAM



B. NCU CIRCUIT DIAGRAM



Set Up For TEL POSITION

	SW1	SW2	SW3
EC GENERAL	A	A	A
SWEDEN	A	B	A
U.K AUSTRALIA A.E.	B	A	B

When You set up SWEDEN,
You may use CT-14 or 17 for SWEDEN.

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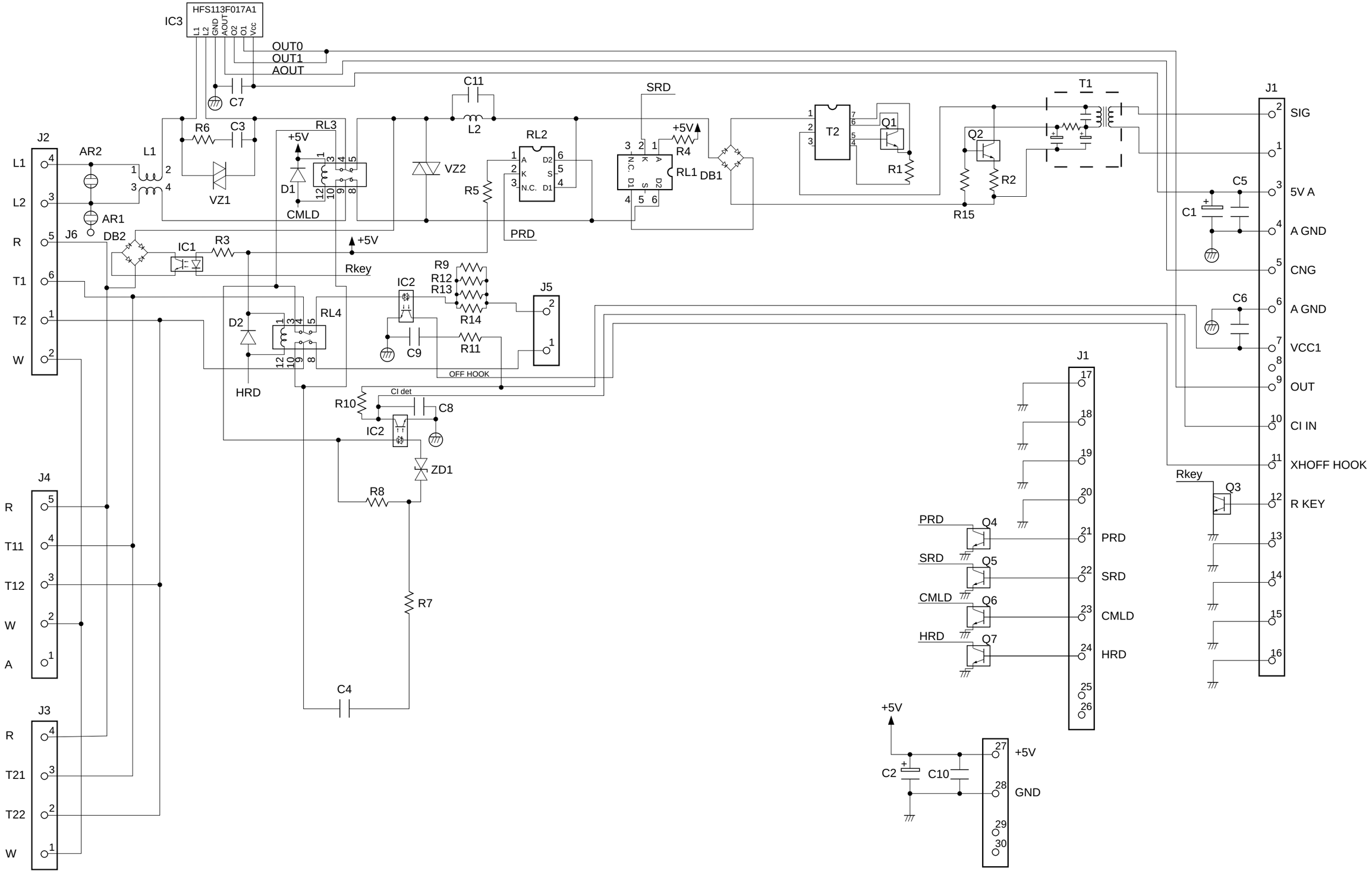

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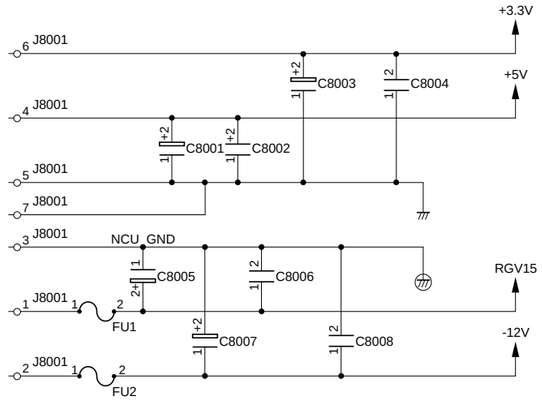
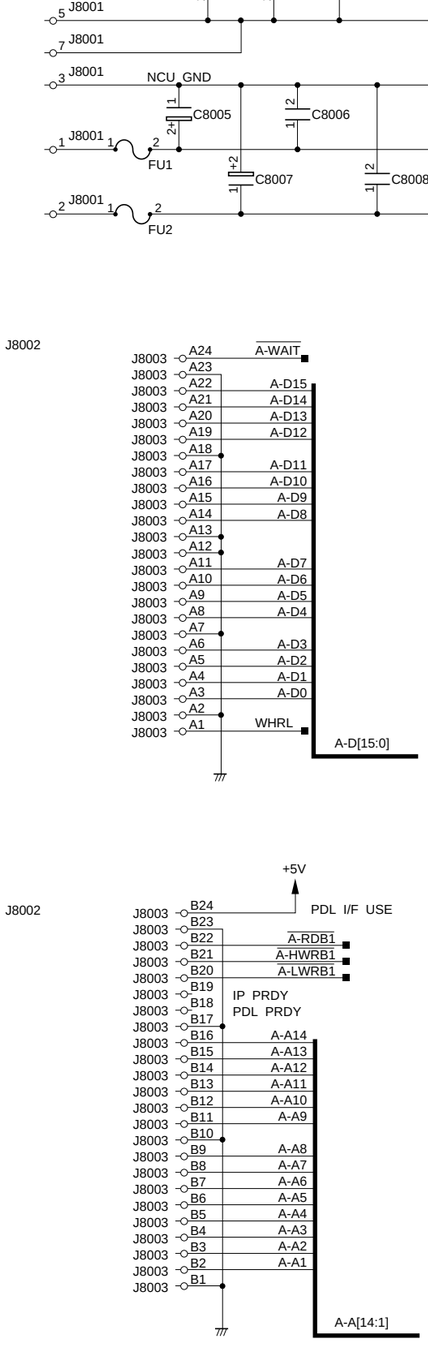
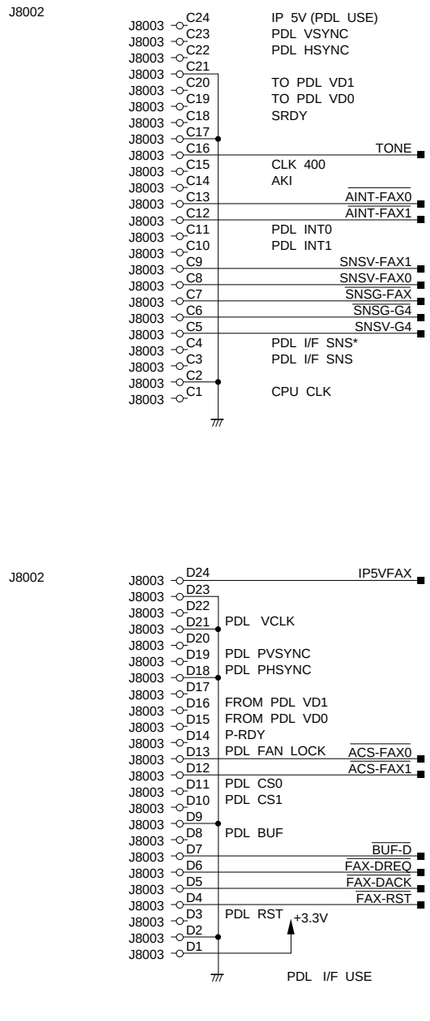
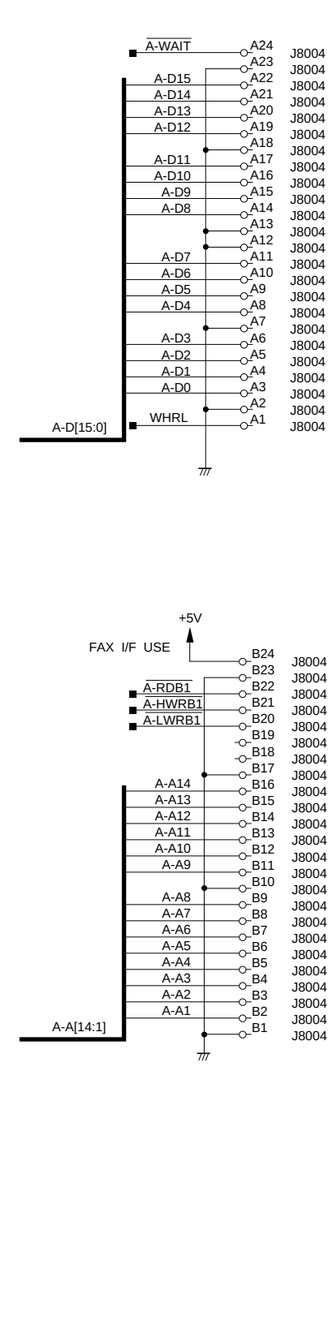
System Mother (1/2)

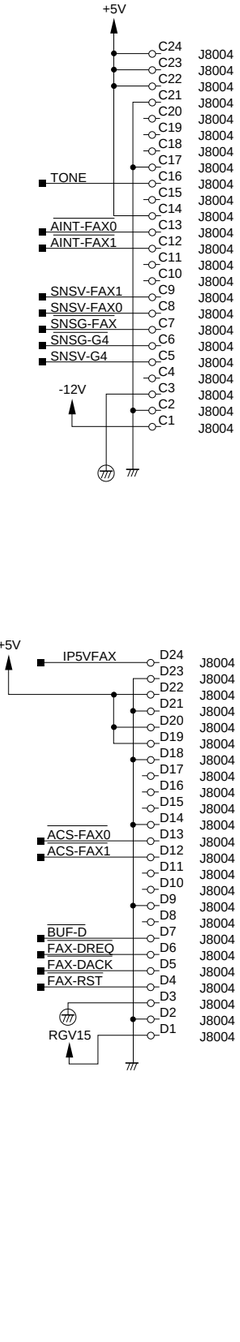


J8002 : IP
J8003 : PDL
J8004 : FAX
J8005 : IP
J8006 : SCSI









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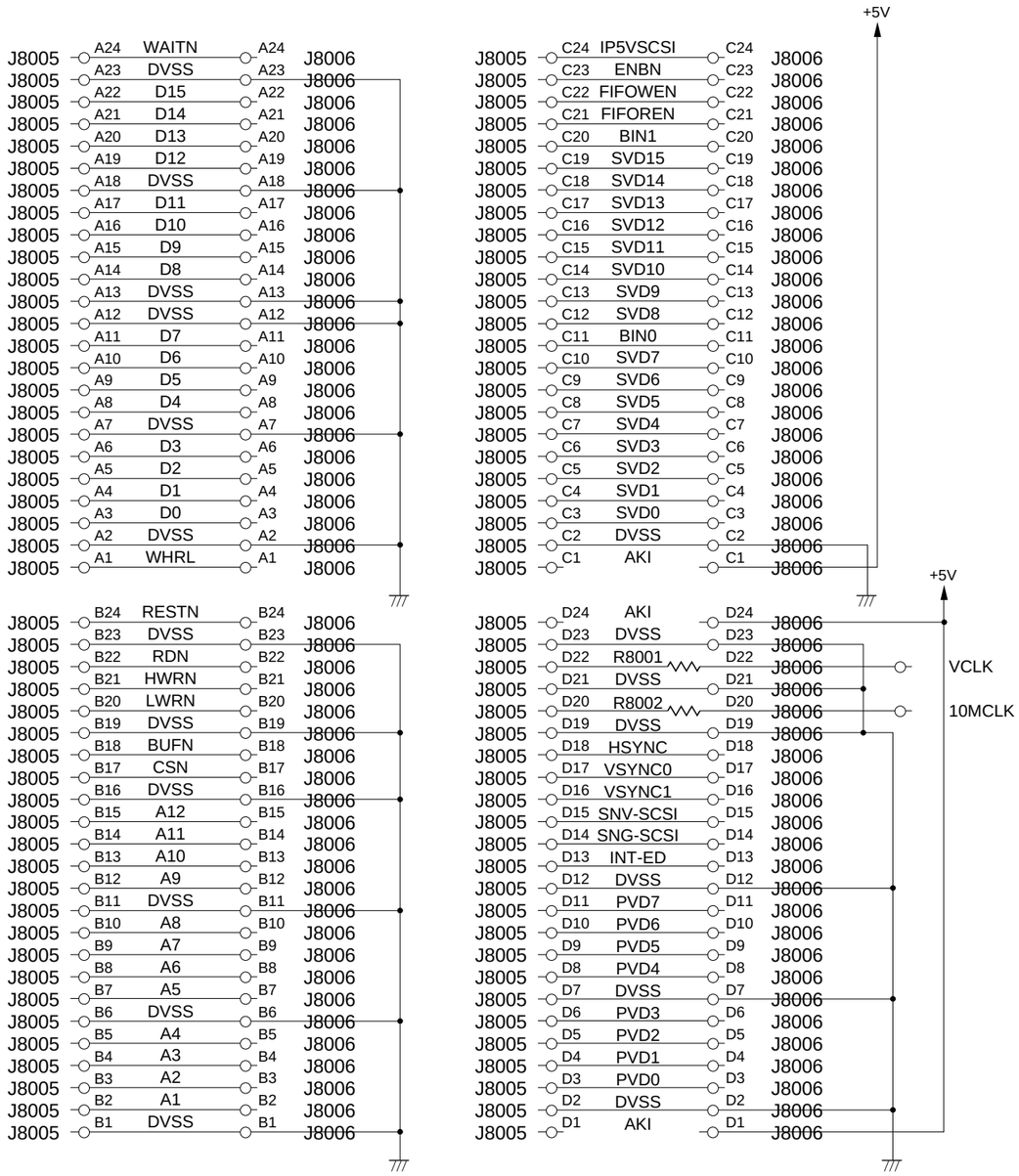
System Mother (2/2)



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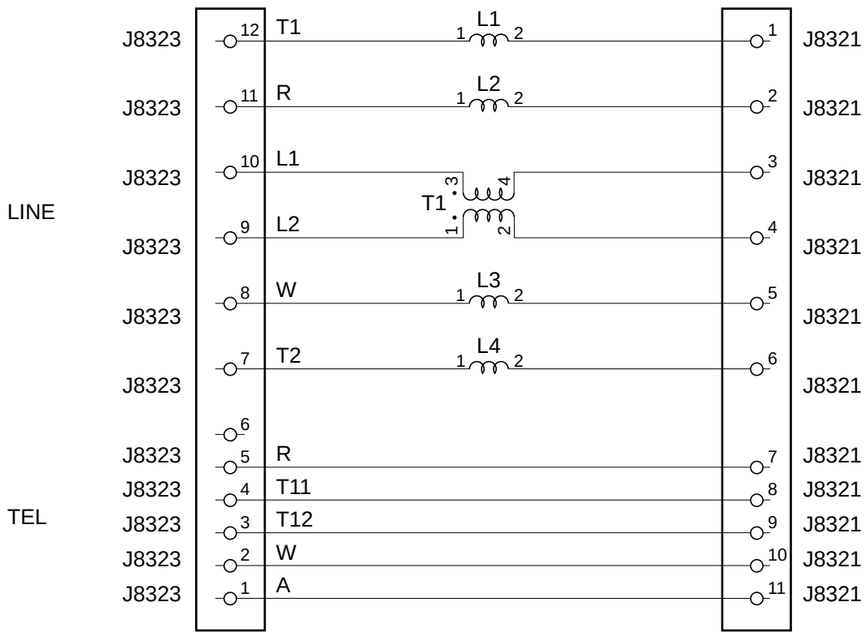
D. MODULAR UNIT CIRCUIT DIAGRAM



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